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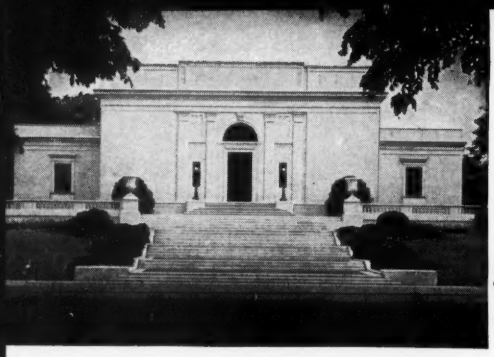


STRAIGHT FROM HEADQUARTERS

By *ROBERT P. FISCHELIS*, Secretary
AMERICAN PHARMACEUTICAL ASSOCIATION

N. F. IX Conference

SO AS to give anyone who so desires, an opportunity to present criticisms or suggestions with reference to the monographs that are to appear in N. F. IX, the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION has arranged for a general conference on the contents of N. F. IX which every interested individual is cordially invited to attend. This conference will be held at the Statler Hotel in Washington, D. C., on Saturday, October 8, at 10 A.M.

To the extent that interested persons have made their desires known, the Chairman of the Committee on the National Formulary has made galley proofs and page proofs of the N. F. IX available and a large number of individuals have been reading these proofs and have offered their suggestions to the Committee. All of these suggestions have been given careful consideration. In view of the fact that the National Formulary Standards for Drugs are the official standards for these drugs under the Federal and State Food, Drug, and Cosmetic Acts, the AMERICAN PHARMACEUTICAL ASSOCIATION desires to make sure that every interested individual or organization has had an opportunity to review these Standards in advance of their final publication. That is the main purpose of the general conference.

If any pharmacist, physician, or other interested individual desires copies of the proof of any particular monograph, it will be supplied upon request in advance of the conference or at the conference. The list of proposed additions to the National Formulary IX was published on pages 184–185 of the March, 1949, issue of THIS JOURNAL.

It is expected that the members of the Committee on National Formulary will be in attendance at the general conference on October 8 and they will give careful consideration to any suggestions at that time.

Those who are unable to attend this conference in person may submit suggestions in writing to Dr. Justin L. Powers, Chairman of the Committee on National Formulary, 2215 Constitution Ave., Washington, D. C.

Diabetes Detection Week

THE week of October 10–16 has been set aside by the American Diabetes Association as Diabetes Week. The objective is to focus attention upon diabetes during this week with special reference to the detection of the estimated one million unknown diabetics.

The American Diabetes Association has requested pharmacists to do their share in detecting those who are afflicted with this disease so that they may be helped to longer life and better health.

Pharmacists may be contacted by medical societies or by local branches of the American Diabetes Association with the suggestion that they carry suitable displays in their shop windows during the week of October 10–16 and that they distribute copies of a leaflet urging those who have not been tested by their physicians to arrange for such test or to make a simple test of their own urine for the purpose of determining whether medical attention is necessary.

While home testing is one of the suggestions to be made through pharmacists to

the public, this should not take the place of a periodic health examination by a competent physician. Early diagnosis and proper medical care for anyone showing symptoms of diabetes is an important factor to preclude other complications.

The American Diabetes Association will be glad to supply circulars to pharmacists for distribution. To obtain these, address the American Diabetes Association, Inc., One Nevins St., Brooklyn 16, N. Y.

Curbing the Greatest Killer

ON PAGE 530 of THIS JOURNAL, Dr. J. C. Van Slyke, director of the National Heart Institute of the U. S. Public Health Service, tells of the problems of heart disease. This article is timed as a general review of the problems and plans which have led to concerted methods of combating this predominant cause of death among the people of the United States today.

On page 560 there appears the first of a series of bi-monthly articles on heart disease, which are intended to educate pharmacists and their assistants on the types of complaints which may have a bearing on the condition of the individual's heart and vascular system. It will be made clear in these and subsequent articles that early diagnosis and prompt treatment by competent physicians often lead to extension of the life span and make the victims of heart disease very comfortable.

An inestimable amount of good has been accomplished by the educational work so far performed through the cooperation of the U. S. Public Health Service and the AMERICAN PHARMACEUTICAL ASSOCIATION in these matters. In addition, the pharmacies of the nation have received much greater recognition on the part of health officers, physicians and the public as health education centers.

Those members of the ASSOCIATION who have signified their interest in these health programs will soon receive the first of a series of counter card displays directed to the public and an educational message directed especially to pharmacists for posting in the prescription room.

If any of our readers are not now receiving the bimonthly educational material on heart disease, a request addressed to the ASSOCIATION'S office at Washington will assure prompt delivery of this material.

U. S. P. Committee Members

NOW comes the decennial task of selecting competent persons to revise the U. S. Pharmacopœia in the decade beginning with 1950.

The Executive Committee of the U. S. P. Revision Committee has determined that the forty non-medical members of the Revision Committee should include experts in the following categories: analytical chemistry, biochemistry, inorganic chemistry, microanalysis, general organic and physical chemistry, reagent experts, steroid chemistry vitamins, volatile oils, antibiotics, bacteriology, immunology, virology, sterilization, endocrinology, microbiology, pharmacology, statistics, dermatologic and external preparations, drug extractives, hospital pharmacy, liquid and miscellaneous preparations, parenteral solutions, prescriptions, tablets and capsules, pharmacognosy, morphology and taxonomy.

Most of pharmacy's representatives on the U. S. P. Revision Committee will be drawn from the faculties of colleges of pharmacy, the research and control laboratories of the drug industry and a few from hospital and private pharmacies and from private or governmental laboratories. National and state pharmaceutical associations as well as colleges of pharmacy should make careful selections of eligible persons for nomination to the Committee of Revision.

There are special forms available on which the qualifications of nominees can be set forth and these have been circulated to organizations entitled to send delegates to the U. S. P. Convention.

Additional forms can be obtained from Dr. Adley B. Nichols, Secretary of the Nominating Committee, 4738 Kingsessing Ave., Philadelphia 43, Pa. The completed recommendation form should be returned to Dr. Nichols. State pharmaceutical associations should also be giving serious thought to the selection of their list of delegates to the U. S. P. Convention which will be held in Washington, D. C., on May 9 and 10, 1950, the week after the 1950 A. PH. A. Convention in Atlantic City. The delegates elect the officers of the convention and the Revision Committee.

Outstanding members of state pharmaceutical associations, who have an interest in U. S. P. standards and procedures, should be chosen for these important assignments.

THE PROBLEM OF HEART DISEASES

By C. J. VAN SLYKE, M. D.

Director, National Heart Institute
National Institutes of Health
Bethesda, Md.

ANCIENT medical authorities considered the heart immune to all disease. Only the suffering of the soul, they believed, affected the heart. Today a considerably different view is held by those concerned with health and medical problems. Diseases of the heart and circulation are today our number one public health problem. Awareness of this is evidenced by the increasingly widespread publicity being given by newspapers, magazines, and radio to the mortality rate and to the investigation, control, and treatment of heart ailments.

This article supplies background information of particular interest to pharmacists who are cooperating in the year 'round health information program conducted cooperatively by the American Heart Association, the U. S. Public Health Service, and the American Pharmaceutical Association. The first of a series of editorials on heart disease will be published in this issue of The Journal. These editorials will appear bimonthly under the department heading, "The Public's Health—Your First Concern." For No. 1 in the series, see page 560.

The scope of the heart problem is one of ever-increasing magnitude, embracing a larger segment of our population with each passing year. The importance of this problem should be of concern to every thoughtful citizen. It is of particular concern to the pharmacist, who is a most important guardian of health in the community.

It is most gratifying then to know that the AMERICAN PHARMACEUTICAL ASSOCIATION is now joining the American Heart Association and the National Heart Institute of the U. S. Public Health Service in their fight against heart diseases, continuing in 1949–1950 its program of health information begun with the cancer program last year.

It is only logical that greater emphasis in public health issues is now being given to the so-called "degenerative diseases." Although unsolved problems still exist with respect to tuberculosis, pneumonia, infantile paralysis, and other infectious diseases, our mortality

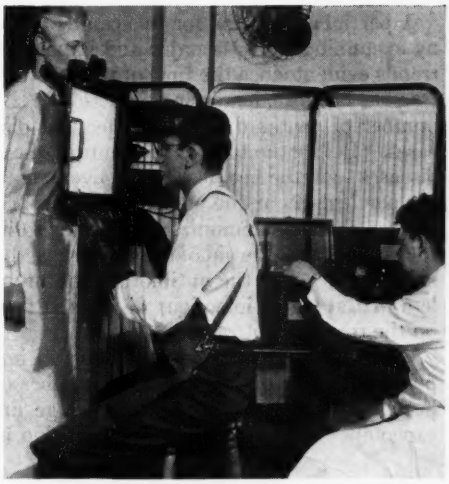
figures clearly point the direction in which our main efforts now need to be channeled. Based on the latest figures available, heart diseases, cancer, and nephritis—all associated with degenerative processes—are our greatest disease killers and therefore pose the greatest public health problems.

Heart diseases are assuming a greater and more conspicuous role than ever before in our nation's disease picture. Today more that one in every three deaths in our population is due to a disease of the heart or circulation. While accurate figures are not available, there are at least four million individuals in the United States suffering from some heart ailment, with some estimates placing the total at two or three times this number. At least 152,000,000 work days lost every year, it has been estimated, is the economic price our country must pay as a result. A rough but conservative calculation of the productivity value lost would place the sum at more than a billion dollars. Inestimable, however, is the suffering, shock, and tragedy accompanying these conditions.

Five Principal Heart Conditions

Although medical science has classified more than 20 types of heart disease capable of causing death, there are principally five types which account for this grim picture. Congenital malformation, due to the failure of the heart to develop properly during the prenatal period, and rheumatic heart disease, a condition frequently left in the wake of rheumatic fever, are the two heart conditions encountered in childhood. Syphilitic heart disease, while appearing most often in middle age, is usually a late result of a syphilitic infection contracted in early adult life.

A close-up view of physician making an electrokymographic examination. Note electron photo multiplier tube in center of fluorescent screen.



Among important research work are studies investigating and evaluating instruments which will aid the physician in diagnosing heart conditions. The electrokymograph (shown above) was developed cooperatively by Temple University and the U. S. Public Health Service for this purpose. Using a highly sensitive electron photo multiplier tube, it records the movements of the heart's borders as blood is pumped through the body. Scientists perfecting the instrument hope it will supply the physician with an early case-finding tool which will detect variations from normal long before a serious or fatal heart attack occurs.

The remaining two heart conditions of outstanding importance are hypertension, where prolonged high blood pressure of an unknown origin has affected the heart, and coronary arteriosclerosis, a hardening of the nutrient arteries supplying the heart. While the former types are of developmental or infectious origin, these latter conditions, although encountered occasionally in younger people, occur most frequently in middle and late life and are therefore usually associated with the degenerative process of aging.

Factors Influencing Mounting Mortality

It is only within the past forty to fifty years that diseases of the heart have gained the prominent position in our disease and mortality picture they now hold. Today there are few among us who do not know of some relative or friend suffering from a heart ailment.

A partial accounting for this can be made by examining the two major and important trends evident since the turn of the century. One has been the increasing reduction in the number of deaths due to the infectious diseases. Before the turn of the century these diseases took the heaviest toll in lives, striking particularly at the age groups under 35. Today, through immunization, better sanitation, and with the aid of the new drugs, the sulfonamides and the antibiotics, the problem of the major infectious diseases is now on the road to control.

The second major trend that has an important bearing on the mounting number of heart deaths is the increasing average life expectancy of the individual today, due in part to the conquest of the infectious diseases, but stemming also from better nutrition, improved personal hygiene, and higher standards of living. This has resulted in a relatively larger number of our population living well beyond middle age into the period of life when heart and circulatory ailments predominate as a cause of death.

This predominance of heart diseases in the older age groups can be readily grasped from a Massachusetts chronic disease survey which showed that the prevalence of heart disease between the ages of 40 and 80 approximately doubled every ten years, with the increase even more rapid for disabling heart conditions.

Younger Age Groups Affected

Although the important increases in heart diseases are found in the upper age groups (which may be indicative, from a defensible standpoint, of the great strides by medical science in combating infectious diseases and thereby helping to prolong life), a considerable problem and of tragic import is the number of heart conditions encountered in the younger age groups.

Rheumatic fever which results in rheumatic heart disease—if we exclude accidents—is today the leading cause of death in the United States between the ages of 5 and 19 years and ranks second between 20 and 25 years. According to statistics based on a study of rheumatic fever patients at the Good Samaritan Hospital in Boston, approximately one in every five children who developed rheumatic fever died within ten years. Not less than a half million children of school age (5 to 15 years) in this country, it has been estimated by the Children's Bureau of the Federal Security Agency, have rheumatic heart disease. The starkness of this menace to children is not lessened by its after effects—the debilitation and crippling that follow frequently in later life as a result of this disease, childhood's greatest enemy.

A tragic occurrence each year, of intimate knowledge to most of us, is the increasing numbers of men active in the professions, the sciences, and in business, between the ages of 35 and 50, who are cut short in mid-career by fatal heart episodes due to coronary heart disease. Impossible to measure in economic terms, this loss of valued experience and mature ability frequently comes when the victim is just beginning to make his richest contribution to society.

A New Outlook

The hopelessness of this cardiac picture is not altogether unrelieved. Although in most instances all that can be done is to relieve symptoms and to lessen complications (measures which do prolong life and contribute to productive years), medical science is making steady progress in seeking the causes and cures of the various heart conditions. Today, as a result of these efforts, there are forms of heart disease which can be arrested, some reversed, and some even cured. This is in direct contrast to the negative attitude assumed by the majority of medical men 30 years ago. A new outlook of hope now prevails where before the old psychology of fear dominated.

Although there are many acute and subtle cardiac puzzles confronting medical science in respect to the major heart diseases, essentially these conditions pose three great problems.

These are (1) how to prevent heart diseases in children; (2) how to reduce—and if possible prevent—the number of deaths in early and middle adult life caused by degenerative heart disease; and (3) how to prolong and make more useful the lives of the aged with heart conditions. All of these great problems involve finding causes, which in turn means more intensified research.

Our most important need in combating the menace of heart disease is new knowledge. We need to broaden the base of our knowledge—and at a faster rate. This can be accomplished only through greater support of research and the development of our research potential from which research activity must spring and grow. Fortunately, organizations and support are now at hand to help, as a result of which the scale of activity, both in the laboratories and through fellowships, is constantly being stepped up as this support is made available.

Non-Federal Support of Heart Research

This assault on heart diseases through basic research is being mounted from two directions—private and voluntary organizations set up to collect and administer funds from private sources; and public agencies administering Federal funds made available by Congress. These various agencies have been created in response to the widening recognition of the needs in this field of health.

The recent reorganization of the American Heart Association from a small scientific association to that of a national voluntary health agency that includes lay people in its membership and on its governing bodies has been an important factor in the development of public support for the campaign against heart diseases. As a result of its successful 1949 campaign, the American Heart Association recently awarded $250,000 for studies in heart diseases and for research fellowships, while local heart associations throughout the country contributed approximately $500,000 in support of research in medical institutions in their localities.

The Life Insurance Medical Research Fund, formed by 148 life insurance companies in 1945 to promote basic research in the medical sciences, announced at its outset that it would devote its entire annual fund for the first five years to cardiovascular research. Approximately $1,900,000 has been awarded by the Fund to such research in its three years of operation, awarding this year alone $680,000.

Also promoting and encouraging research in the heart field is the Helen Hay Whitney Foundation, which is devoting its entire income to research in rheumatic fever and rheumatic heart disease. The Foundation awarded $200,000 this year for such research.

Federal Support for Heart Research

Reflecting the growing interest and concern of the government with this major health problem, Congress last year established the National Heart Institute as one of the National Institutes of Health, the research arm of the Public Health Service. In addition to a program of research in its own laboratories, the Heart Institute, through a system of financial grants, is aiding cardiovascular research conducted by medical schools, hospitals, and individual private investigators; awards are also granted for fellowships and traineeships. Determining the policies and allocation of funds by the Institute is the National Advisory Heart Council, composed of outstanding leaders in the medical sciences and in public affairs.

Within a year of its establishment in August. 1948, the Heart Institute had awarded $2,730,000 in research and fellowship grants. A recent congressional appropriation of $16,075,000 to the Institute will materially speed needed heart research. The Heart Institute is thus working hand in hand with voluntary agencies and private institutions toward the common goal: the reduction of disability and death caused by heart disease.

Recent Significant Advances

Already significant advances have been made in dealing with the various heart problems. Recent findings have indicated a relationship between congenital heart defects and German measles contracted by the mother during pregnancy. Further investigations in this direction may lead in time to preventive measures—perhaps a vaccine during pregnancy—which will obviate this condition that dooms many children at birth to either an early death or lifelong invalidism. New surgical techniques now make possible the correction of several of the most common and most serious of these congenital malformations.

Intensive studies are under way in medical schools, hospitals, and laboratories

throughout the country seeking the agent or agents responsible for rheumatic fever and its frequent sequel, rheumatic heart disease. A relationship to streptococcal infections has been indicated. The use of sulfonamides or penicillin as a preventive therapy following an initial attack of rheumatic fever has been widely accepted by medical authorities. There is considerable evidence to indicate that this type of therapy aborts subsequent recurrences of rheumatic fever by preventing further streptococcal attacks, thus offering some hope for controlling the extent of heart damage that results from repeated attacks. The solution of this rheumatic fever enigma would lower appreciably the future incidence of heart diseases, as rheumatic heart disease, together with hypertension and coronary arteriosclerosis, is responsible for perhaps 90% of all heart conditions.

Progress in Treatment

An outstanding example of a heart condition formerly hopeless but now definitely coming under the control of medical science is bacterial endocarditis, an infection of the lining of the heart. Formerly fatal in 99% of all cases, this condition can now not only be cured in 70–75% of such cases by the administration of large amounts of penicillin, but can be prevented in many instances by a prophylactic administration of penicillin before and after the extraction of teeth or other operations, especially those about the mouth or throat.

Syphilitic heart disease is another heart condition which medical science today can successfully prevent. Since this condition is usually a late complication of a previous infection, adequate early treatment of this disease and continued public health measures to prevent the spread of syphilis now offer promise of eliminating this form of heart disease.

In hypertension, the most common cause of heart disease in middle age, a number of measures are proving useful in ameliorating the condition, although its origin continues to baffle medical science. Aside from drugs used to relieve temporarily the symptoms of hypertension, a low salt diet has produced varying and in some instances highly successful results in lowering temporarily or for prolonged periods increased blood pressure levels. Surgery, severing nerve channels, has also proved beneficial in a certain proportion of selected cases so treated.

And finally, even in heart disease associated with aging and degenerative processes—coronary arteriosclerosis, or hardening of the arteries supplying the heart—some progress may be reported. A relationship between this hardening process and excessive quantities of a fatty substance in the blood serum called cholesterol has been indicated. Whether the basis for this lies in a breakdown of the body's fat metabolism or in a dietary maladjustment has yet to be determined, with considerably more research needed for a definitive answer.

Importance of Dicumarol

Of great importance in this field has been the discovery and use of dicumarol as a anti-clotting agent. When administered to those recovering from coronary thrombosis, it has been effective in reducing the incidence of fatal complications which often follow such attacks.

An important development stemming from the investigation of dicumarol has been the inauguration of cooperative studies conducted by several groups who investigate and evaluate simultaneously new developments in research that show excellent promise. By this method, the time spent in painstaking evaluation surveys is pared to a minimum. Dicumarol, for example, as a result of a joint cooperative study of the American Heart Association and 16 hospitals in ten cities, with financial support by the U.S. Public Health Service, was evaluated in 18 months, whereas any one of the participating teams working alone would perhaps have taken ten years to secure the same information.

A major contribution aiding the study and treatment of heart disease has been the differentiation of heart disease into its various types. This progressive step has proved instrumental in directing medical attention to the causes of heart disease, thereby establishing a solid foundation for the proper understanding, study, and prevention of the various conditions affecting the heart.

Pharmacists Important as Educators

Despite the progress made by medical science, the causes of many of the major diseases of the heart and blood vessels have

. . . . . A. Ph. A. Names Officers-Elect

OFFICERS of the AMERICAN PHARMACEUTICAL ASSOCIATION elected to serve during the 1950–51 term are as follows: Henry H. Gregg, practicing pharmacist of Minneapolis, Minn., president-elect; Roy A. Bowers, dean, University of New Mexico College of Pharmacy, Albuquerque, M. Nex., first vice-president-elect; Louis J. Fischl, practicing pharmacist of Oakland, Calif., second vice-president-elect; and members-elect of the Council—B. V. Christensen, dean, College of Pharmacy, Ohio State University, Columbus, Ohio; H. A. B. Dunning, practicing pharmacist and pharmaceutical manufacturer, Baltimore, Md.; and Ernest Little, professor of chemistry and former dean of the New Jersey College of Pharmacy, Rutgers University, Newark, N. J.

Election of A. PH. A. officials was conducted by a mail ballot which was submitted to all members in good standing. The ballots were counted by a Board of Canvassers appointed by President Jenkins and the results were certified to the Secretary.

The Board of Canvassers consisted of George F. Archambault, chairman, Charles Bliven and L. M. Kantner. Members of the Board were assisted with the tabulation of ballots by George P. Hager, Kenneth E. Hanson, Arnold H. Dodge and Ernest Simnacher.

The newly elected officers will be installed at the annual A. PH. A. Convention in Atlantic City, N. J., during the week of April 30, 1950.

Present officers of the AMERICAN PHARMACEUTICAL ASSOCIATION who will continue to function until the Atlantic City Convention in April, 1950, are: Glenn L. Jenkins, dean, School of Pharmacy, Purdue University, Lafayette, Ind., president; Harold C. Kinner, practicing pharmacist of Washington, D. C., first vice-president; Leib L. Riggs, practicing pharmacist of Portland, Oreg., second vice-president. Robert P. Fischelis of Washington, D. C., is secretary and Hugo H. Schaefer, dean, Brooklyn College of Pharmacy, Long Island University, is treasurer of the ASSOCIATION.

PROBLEMS OF HEART DISEASES

(Continued from preceding page)

yet to be discovered. Until these are revealed our immediate progress will depend upon more intensive application of the means we have at hand for dealing with these conditions.

As a force in his community, the pharmacist can lend his influence and assistance in helping to eliminate unnecessary attitudes of fear and fatalism by informing the public of the essential facts already known to medical science. By urging patrons with symptoms to seek competent medical advice, he can be instrumental in guarding individual health. The pharmacist therefore has a vital role to play in helping develop in the public a broad understanding of the facts of heart diseases and the need for early diagnosis.

Though heart diseases are difficult to solve, they are not necessarily fatal. We can still do much with existing medical knowledge, not only to postpone the onset of heart conditions, but also to slow down their progress. Our ability to do so depends upon our alertness and the vigor of our efforts in meeting this most challenging public health problem.

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41 Per Cent of U. S. Hospitals Now Have Pharmacy Departments

Approximately 41% of the hospitals in the United States have pharmacy departments, according to statistics published in the *1949 Directory of the American Hospital Association*. Of the 6,160 hospitals reporting, 2,737 indicated that they have pharmacies. This is a 2% increase over the previous year.

Of the hospitals classified in the *Directory* under the General and Special Short Term category, the number of hospitals with pharmacies is far greater among larger institutions than the smaller ones. Almost all hospitals with more than 250 beds have pharmacies. Pharmacy departments were reported for 76.1% of the hospitals in the 100 to 249 bed size, 31.67% of the hospitals having 50 to 99 beds, and 16.6% of those under 50 beds. In the long-term hospitals, 42.8% were reported as having pharmacies and 86% of the Federal hospitals had pharmacies.

CONFERENCE COMMITTEE ON

FOOD, DRUG AND COSMETIC LAW PROBLEMS

MEETS WITH FDA OFFICIALS

POINTS of agreement and differences in the interpretation of sections of the Food, Drug, and Cosmetic Act and regulations dealing with prescription compounding and dispensing were the chief topics of discussion in the initial meeting of the Joint Conference Committee on Federal Food, Drug, and Cosmetic Law Problems with Commissioner P. B. Dunbar and other officials of the Food and Drug Administration in Washington, D. C., on August 3.

The Committee, which consists of representatives of the AMERICAN PHARMACEUTICAL ASSOCIATION, the National Association of Retail Druggists, the American College of Apothecaries, the American Society of Hospital Pharmacists and the National Association of Chain Drug Stores, organized at a preliminary meeting of the Committee held the same day by naming Hugo H. Schaefer, representing the A. PH. A. and Nicholas S. Gesoalde, representing the N. A. R. D., as co-chairmen, with Mr. Gesoalde to act as presiding officer during the first year.

The Committee requested A. PH. A. Secretary Robert P. Fischelis and George H. Frates of the N. A. R. D. to share the duties of secretary with Dr. Fischelis acting from the ensuing year.

The Joint Committee is the outgrowth of action initiated by both the National Association of Retail Druggists and the AMERICAN PHARMACEUTICAL ASSOCIATION in their respective conventions and in their contacts with the Food and Drug Administration which made it clear that some medium was needed for the interchange of information between the Food and Drug Administration and practicing pharmacists as to the interpretation of the law and regulations.

The hope was expressed on the part of both the government officials and the Associations represented that exchange of views could be arranged prior to the promulgation of interpretations of regulations which vitally affect retail pharmacists and others in their daily practice.

At the afternoon meeting of the Committee with the government official both sides expressed the hope that establishment of a contact of this kind, which is similar to the liaison effected by the pharmaceutical manufacturers through their contact committee, would prove extremely helpful in bringing about better compliance with the laws and regulations and assist in improving

JOINT CONFERENCE COMMITTEE ON FEDERAL FOOD, DRUG, AND COSMETIC LAW PROBLEMS. From left to right (seated): Associate Commissioner Charles W. Crawford; Nicholas Gesoalde; and Dr. Paul B. Dunbar, Commissioner of Food and Drug Administration. (Standing): Mearl D. Pritchard; Herman S. Waller; Hugo H. Schaefer; George H. Frates; Robert P. Fischelis; Assistant Commissioner George T. Larrick; John E. Donaldson; and Dr. Robert T. Storemont, Medical Director, Food and Drug Administration.

the effectiveness of the laws and regulations in protecting the public.

Following a comprehensive discussion of the phases of the law which affect prescription practice, it was agreed to review the opinions expressed at a future meeting. It was the consensus of those taking part in the meeting that the discussions had been very constructive and had served to clarify the points of view of the officials as well as of the representatives of pharmacy.

Whether or not clarification of the regulations or amendment of the law are indicated will be determined when the Committee confers again with representatives of the Food and Drug Administration.

The personnel of the Committee is as follows: Representing the A. PH. A., Hugo H. Schaefer; Mearl D. Pritchard, who also represents the American College of Apothecaries; Don E. Francke, who also represents the American Society of Hospital Pharmacists; Robert P. Fischelis, *ex-officio;* representing the N. A. R. D., Nicholas S. Gesoalde; Herman S. Waller, George H. Frates; John W. Dargavel, *ex-officio;* representing the National Association of Chain Drug Stores, John E. Donaldson.

N. A. R. D. Meets September 18-22

Vice-President Alben W. Barkley and Poet Edgar A. Guest are among the featured speakers who will be on the program of the 51st annual convention of the National Association of Retail Druggists in New York City, September 18 to 22.

The pros and cons of President Truman's proposed health program will be discussed by Federal Security Administrator Oscar R. Ewing and Dr. Louis H. Bauer, chairman of the board of trustees of the American Medical Association. J. O. Peckham, executive vice-president of A. C. Nielsen Co. of Chicago, Ill., will report his observations on the British National Health Service.

Speakers who will deliver addresses on topics pertaining to the prescription department or the profession of pharmacy include H. J. Anslinger, U. S. commissioner of narcotics; Frederick D. Lascoff, prominent retail pharmacist of New York City; Dr. H. C. Newton, dean of the Massachusetts College of Pharmacy; Robert A. Hardt, vice-president of Hoffmann-La Roche, Inc.; and Charles F. Lanwermeyer, chief pharmacist of the Abbott Laboratories.

Extensive consideration will be given to the problems of fair trade. The system of stabilized prices will be discussed in various reports and also in the addresses of Senator Herbert Humphrey of Minnesota and Maurice Mermey, director of the N. A. R. D. Bureau of Education on Fair Trade. Speakers on the related subject of small business include Congressmen Wright Patman of Texas and Charles A. Halleck of Indiana.

Other features of the convention will be the annual drug show and various entertainment sponsored by several manufacturers in the drug and related fields.

New Source of Cortisone

Because certain plants of the *Strophanthus* variety are believed to offer a source of supply for cortisone (Compound E), an African expedition jointly sponsored by the U. S. Public Health Service and the Department of Agriculture has been dispatched to obtain specimens of various plants which grow in equatorial Africa, Malaya, Liberia and certain areas of eastern China.

It is believed that the plants contain steroid compounds from which cortisone may be more easily synthesized than from ox bile which is the present source. Cortisone, as previously reported, is an adrenal cortical steroid whose value has recently been established in controlling the symptoms of rheumatoid arthritis.

Chemical Industries Exposition

The 22nd Exposition of Chemical Industries will be held in Grand Central Palace, New York City, November 28 to December 3. Featured at the exposition will be exhibits of chemical and pharmaceutical manufacturers who will display new equipment and products, and demonstrate new methods of processing.

American Standards Association

The 31st annual meeting of the American Standards Association will be held at the Waldorf-Astoria Hotel, New York City, October 11 through 14. An address by Karl T. Compton, president, Massachusetts Institute of Technology, and chairman, Research and Development Board of the National Military Establishment, will climax the four-day series of conferences.

John Uri Lloyd

- **PHARMACIST**
- **PHILOSOPHER**
- **AUTHOR**
- **MAN**

*by Roy Bird Cook**

It seems well to point out at the outset that this series of rambling comments has no semblance to a study of the life of this most versatile man; a man whose memory is honored and respected not only in the field of pharmacy but in spheres of our cultural and social life far removed from the research of drugs. If this paper bears the mark of the land of the tristate—Ohio, Kentucky and West Virginia, and of the great valley of the Ohio River—my reader need not be surprised, for it represents a glimpse into this heart of America, where John Uri Lloyd and his family lived—a land where he spent his life and out of which flowed the results of his labors so that all mankind might be touched with the results and achievements of a most unusual life. It began almost a century ago to the day that we are meeting here in Jacksonville, and it reaches down and touches the youth of the writer, floundering around in the pharmacies and pharmaceutical practice through the latter "gay 90's" at the opening of the present century.

In 1899 a schoolboy took up his work in a typical pharmacy of that day in West Virginia in a land that had its western borders bathed by the waters of the Ohio River. To the north the smoke of industry was surging upward amid the growing pains of Pittsburgh. To the west along the Ohio River stood, and still stands, the sprawling "Queen City of the West," the city of Cincinnati. Across the river were the low hills of Kentucky, and the two cities of Newport and Covington. Along the north shore, clinging to the hills, was the city bearing the name of a great Roman, and back of it rose the hills of Ohio. In this region and on these hills dwelled the Lloyds and their kin, whose influence was to reach out in all directions like a great, many-pointed star. The old family seat was not far from the present greater Cincinnati Airport and one of the farm estates has been set aside for the use of the public as a park and to preserve native plants and trees.

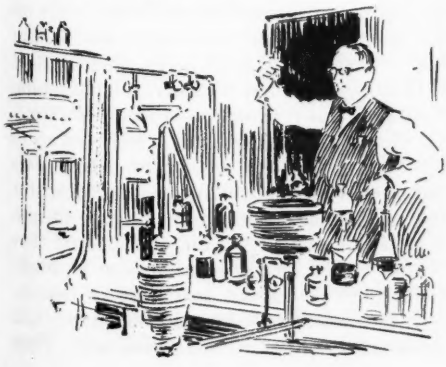
Looking toward both Pittsburgh and Cincinnati was the town of Weston, West

* Retail Pharmacist, Charleston, W. Va.; Secretary, West Virginia Board of Pharmacy; and Past-President, AMERICAN PHARMACEUTICAL ASSOCIATION. Presented before the Section on Historical Pharmacy, AMERICAN PHARMACEUTICAL ASSOCIATION, Jacksonville, Fla., April, 1949.

Virginia. Located here were three drug-stores. They in turn were perfect counterparts of all others in this region. Over or along the top of each prescription case in these stores was a long row of small, four-ounce bottles, whose titles began with the first letter of the alphabet and reached almost to the letter "Z." Closer inspection showed they were Lloyd's Specifics. Day after day over the counters of these stores went prescriptions written by men, who were loved by all, wondered about by other schools of medicine, and were called "eclectic physicians." We never knew any who were not successful, and today, one hundred years after the birth of Dr. Lloyd and the fruition of this school of medicine, two of these men, Dr. George Snyder, of Weston, and Dr. Thomas H. Miller, of Fairmont, are still high in the esteem of all as practicing physicians in this region. Here and there all through this "Lloydland" may be found others, for it is said that over 5000 are still practicing in the United States. It is not strange that the young pharmacist of that day wondered about the who and the why of the medical field, eclectic, homeopathic, alapathic, each with his meed of honor and praise.

Then, too, in almost every store on the desk of the pharmacist-owner was a copy of one or two books, one *Etidorhpa*, which your employer told you was Aphrodite spelled backwards, and the other *Stringtown on the Pike*. The dialect and the understanding of boys portrayed in these two books fascinated the youth of that day as well as his elders. All were from the pen of the man who made the Specifics noted above! And was there a "Stringtown?"

Dr. Lloyd, the pharmacist



Lloyd Library, Cincinnati, Ohio

Indeed there was, for it was none other than the little village of Florence, in Boone County, on the Lexington Turnpike, some 12 miles from the Ohio River, at Covington, which still hugs the low hill divide between the Licking and Kentucky Rivers. The county itself was named for the noted pioneer of western Virginia and Kentucky.

In the library of the writer is a copy of the "Stringtown" book, on the front page of which appears these words: "Captain Robley D. Evans, with the Compliments of his friend, John Uri Lloyd, Cincinnati, Feb. 1, 1901." What pharmacist whose memory goes back into Spanish American War days does not remember "Fighting Bob" who commanded the Oregon in the days of '98, and who later was transferred to the Iowa? Many of these same "old pharmacists," who took in the A. PH. A. meeting in Portland, Oregon, visited this old battleship then sleeping its life away in the Willamette River. What a true record Dr. Lloyd set down in those few brief words, "his friend." He was indeed a friend to all men who knew him. It is further recorded that Dr. Lloyd, Ex-President Cleveland and Evans were great friends and often went on trips together.

The pharmacist of that day who read "Spc. Nux Vomica, gtts. XL, Spc. Rhus Tox. gtts. XX; Alkaline Elixer, oz. II and Aqua. Dist. q.s. 4 oz.," never once stopped to worry about the why, the wherefore and the results. And who can forget the famous Compound Lobelia Powder! For results there were and that was proof enough. Little did they then know that beneath all

Seek Data on John Uri Lloyd

Anyone recalling interesting anecdotes concerning John Uri Lloyd is urged to write Mrs. Corinne Miller Simons, Lloyd Library and Museum, 309 W. Court St., Cincinnati 2, Ohio. All letters will be acknowledged. Mrs. Simons is collecting data for a forthcoming biography of John Uri Lloyd.

this was work, study and results which would, by 1949, be proved beyond all doubt in our field.

There is not the slightest doubt that Lloyd was one of the most versatile men of our age. Those who knew him by the power of the written word as a novelist bear ample testimony to this. Those who knew him by his work in our field can likewise confirm the same conclusion. A continual flow of scientific writings leaves no doubt that he made a number of original discoveries in physical chemistry that were never published. Many of these ideas he used constantly in his pharmaceutical productive work. Others, sometimes through some quirk of circumstances, often got the credit because of some independent discovery or publication.

Unusual Knowledge of Engineering

John Uri Lloyd also had an unusual knowledge of the principles of engineering. This, like his chemical work, has seldom been equalled or excelled. Indeed he was one of the few self-trained, advanced thinkers of our age. And it would not be out of place to point out here that the great publication of the A. PH. A., the National Formulary, was prompted by his study of the botanicals and the publication of his work on the "Elixirs."

In the personal field, there are few of his students who were not left with a life-long impression of this firm, kindly man, who was the friend of every youth. One former student recently recalled his love for the birds and the animals, his love of pets, even a stray kitten that might wander into the classroom. One distinguished physician recalls that not once in a chemistry class did he use a notebook or any book for reference. As Elbert Hubbard once wrote, "He just said it." His very mind was a book. But even then (1891–1893) he was collecting from the ends of the earth every published work in his field that could be located. The results we all know. Many of his students are still engaged in purveying to the sick and all alike testify to the love and respect which they held for him as a teacher.

Contact with W. Va. Pharmacists

His contact with the West Virginia field of medicine and pharmacy were not restricted to the field of teaching. His influence was felt in the 1880's when Edmund Bocking, the distinguished first secretary of the board of pharmacy, A. N. Williams, one-time secretary of the same board, and others were working in the field of the A. PH. A. Dr. Lloyd then and there extended his influence with others than students. An early state association in West Virginia came and went. Lloyd's close friend, Dr. J. H. Beal, from the same Ohio, crossed the river in 1906 and a new West Virginia organization took on life.

To the capital city of Charleston in June, 1908, journeyed Dr. Lloyd. Here two rather unusual sessions took place; one in the "old" capitol building of the State which was burned January 3, 1921, where two hundred pharmacists and supporters turned out. Then came the all-day session on the steamer "John Q. Dickinson" which made a trip up the placid Kanawha River to the town of Montgomery. The steamer stopped at the Marmet Lock after a fine journey on a fine day. Inside the boat the group gathered to hear of pharmacy and medicine from the lips of this unusual man and teacher. Some of his students in pharmacy or medicine were there. Bruce Dawson was the president of the association and the secretary was none other than one of Lloyd's own former students, Arch Krieg. Out on the deck the crowd went later, and in the bow stood Dr. Lloyd. He was thrilled with the looks of the lovely river which came tumbling down from mountains of North Carolina, many miles away, really far up in the sky, some 3300 feet to be exact. His mind must have gone back to Kentucky for the hills along the meadows became to him a land of "knobs." This "knob" and that "knob" kept him entranced, and he made them likewise to this gathering of friends.

It is recalled how he held his thumb and forefinger together, forming a triangle. Then

pointing to the audience he addressed them with a frequent exclamation, "You young people listen, listen to me," even though the audience was made up of people some of whom were as old as he. Others recall his, "Young people, now listen to me, all that I am or all I ever expect to be, I owe to my mother." Little did he then know that on the shore of this river, in sight of where he spoke, would rise the great stacks of modern chemical plants not unlike the pipes of a great organ. Here the field of synthetic chemistry in which he was so interested would reach out over all the earth. But such has come to pass. At noon the party held forth at the New Montgomery Hotel. In the evening Dr. Lloyd was entertained at the noted Ruffner Hotel, in Charleston.

Attended West Virginia Meeting

Dr. Lloyd next attended the West Virginia Association meeting at White Sulphur Springs, July 9 to 10, 1913. Walter C. Price, the president, and C. A. Neptune, secretary, both were well known to the distinguished visitor. To this meeting he brought an illustrated lecture which delighted a large crowd for nearly two hours. The philosopher-teacher, in his own way, followed the illustrations with a fascinating, unprepared talk.

Those sessions were held in the famous old White Sulphur Springs Hotel, a large frame structure, predecessor of the famed Greenbrier Hotel of 1949. It was surrounded by a series of long outside steps where once again the crowd gathered in the sunshine to hear Dr. Lloyd, the archeologist. With his engaging manner he took the group on a trip to the Southwest, showing his deep knowledge of the lives of people now long since gone. He even gave some side remarks on certain Masonic mosaics which he felt might tie in the people of Central America with those of ancient Egypt. An interesting side note is that just before, in 1911, Wallace Procter, son of the famous William Procter, Jr., father of American Pharmacy, had died in Wheeling, West Virginia. The year following was marked by the appearance of the famous Joseph P. Remington. And Dr. J. H. Beal was "one of us," as it were. It was a time of contacts with the great in pharmacy for the druggists of West Virginia!

Dr. Lloyd, the author

Here we leave some of the local touches with our subject and turn to the more generally recorded facts of his life. It may be well to mention that a forthcoming biography will carry a merited study in full detail of his career.

John Uri Lloyd was born in North Bloomfield, New York, April 19, 1849, a son of Nelson Marvin and Sophia Webster Lloyd. The family, we are told, came from New England. The date of his birth, falling as it did on the anniversary of the Battle of Lexington and Concord, occurred just a few weeks after Gen. Zachary Taylor, of Mexican War fame, became President of the United States.

Lloyd Family Moves West

In 1853, the Lloyd family joined the movement of people of that day to the west of the Alleghenies and down the Ohio River. At first the family lived in several locations in Kentucky, notably at Florence, Burlington and Petersburg. The parents were interested in education and both became teachers in the local schools. His father, an engineer, was at one time connected with a proposed railroad to be built between Covington and Louisville. His mother, a poetess of no mean note, to a large degree seems to have influenced her children to become interested in people, in nature, indeed in all aspects of the life of that day.

In 1851, a brother, Ashley Lloyd, was born, who was destined to become the busi-

ness leader of the unusual family. This brother died in 1926. When John Uri was ten years old, and already making observations on the Kentucky "turnpikes," another little brother was born. He carried the name of Curtis Gates Lloyd and he also died in 1926.

If we believe in heredity there must have been some scientific strain of decided bearing in this family for the younger brother also became a pharmacist, and then to make life more interesting became one of the world's greatest mycologists. His collection through the years of fungus specimens contributed extensively to the knowledge of medicinal plants and their history and has made Cincinnati a center in this field of science. Under the title of *Drugs and Medicines of North America*, the two brothers, in 1884–1887, published a series of monographs which were later reprinted. This great team of brothers in time founded the famous Lloyd Library, one of the outstanding research libraries in the world, containing, as it does, over one hundred and ten thousand volumes of books and some ninety thousand pamphlets.

Returning now to John Uri we find him at the age of 12 observing with a boy's natural interest the departure from Kentucky of troops in the opening days of the Civil War. Some regiments marched into southern West Virginia and others entrained for the opening of operations under McClellan, along the Baltimore and Ohio Railroad in northern West Virginia. In this group was the famous German regiment from Cincinnati, among whose members were many people Lloyd was to know as he grew to manhood. He recorded that he saw Abraham Lincoln, and heard him speak at the old Burnet House when on his way to Washington! We can well imagine that the talk in the old store at "Stringtown on the Pike" was full of the talk of war. So it remained until the spring of 1865 when his older neighbors, those who survived, came home, some in uniforms of dusty Gray and others with faded Blue.

Chemistry Appealed to Him

Chemistry held a great appeal for this unusual boy and pharmacy fitted in with that field of interest. We find him apprenticed to W. J. M. Gordon, in Cincinnati, in 1863 and from here he went to the George Eger Pharmacy. In this period through the inspiration of Dr. John King he became interested not only in pharmacy but also in that particular school of medicine which emanated from the regions of Cincinnati.

Interest in Eclectic Medicine

It may be proper here to devote a bit of attention to the rise of "botanical" medicine and pharmacy, or the eclectic school of thought. In 1817, C. S. Rafinesque, a man of many talents, assumed the chair of botany of Transylvania University located in Lexington, Kentucky. John E. Cooke, M.D., and many other names, famous in the field of medicine, were connected with this school. In 1830 Rafinesque published a *Manual of Medical Botany* which many regard as the first handbook in the country to meet the needs of intelligent physicians. Here it is affirmed that "pharmacy by the aid of botany and chemistry has become a science."

Later, in 1852, appeared the *Eclectic Dispensatory of the United States*. This came in time to be *King's American Dispensatory*. The whole field revolved around the work of John King, Robert S. Newton, Dr. John Scudder and others. Without going into details it may be said that Dr. Lloyd, in the years to follow, devoted the greatest part of his life to pharmaceutical work in the field of eclectic medicine. By the time the 15th edition of the basic book of that system came from the press, he became one of the editors.

In addition to his work in the drugstores, always with an unsatisfied ambition for knowledge, he attended the chemistry class of Dr. Robert Bartholow, of the Ohio Medical College. Later he delved into the mysteries of anatomy at the Miami Medical College under Dr. Clendenin. Then his talents turned to employment with one of the older early pharmaceutical makers, operating under the name of H. M. Merrell Company, at Court and Plum Streets, Cincinnati. In 1876 he acquired an interest in this firm and it became Merrell, Thorp and Lloyd, changed in 1881 to Thorp and Lloyd Brothers and in 1885 to Lloyd Brothers. His associates were his brother N. Ashley Lloyd and Curtis Gates Lloyd, the youngest brother. It is by this name that the firm is best known to us. In 1924 due to advancing age of the owners it became Lloyd Brothers Pharmacists, Inc. In 1938 it was

sold to S. B. Penick Company of New York City. This firm for many years produced the famous Lloyd's Specific Medicines (and still does in limited amounts), specializing in drugs of botanical origin. As is well known the Eclectic School to a large degree passed up drugs of mineral origin. Under the management of John Uri Lloyd the company assumed not only a leading position in the field mentioned, but it also assumed a place of leadership in pioneer plant chemistry, colloidal chemistry and new pharmaceutical methods.

A Man of Many Talents

But Dr. Lloyd's talents were by no means restricted to the office of a manufacturing plant. As early as 1881 his *Chemistry of Medicines* appeared. To follow the list of professional publications from his pen, or jointly with that of his brother Curtis, would make a voluminous index. John Uri alone wrote eight scientific treatises and more than 5000 articles and scientific papers. From 1883 to 1887 he was professor of pharmacy at the Cincinnati College of Pharmacy, which has a history reaching back to 1852, when the A. Ph. A. was first getting started. In 1878 he became professor of chemistry and later president of the Eclectic Medical Institute, retiring from that post in 1904. He served as editor of the *Pharmaceutical Review*, the *Eclectic Medical Journal* and the *Eclectic Medical Gleaner*, yet found time to explore many avenues of plant chemistry and produce contributions to medical literature numbering into the hundreds. During this period (1887–1888) he served as President of the American Pharmaceutical Association. As a result of his labors, some five educational institutions conferred degrees ranging from M.D. to LL.D. upon him. He was honored three times with the Ebert prize and in 1920 the Remington Honor Medal was awarded him for his research in colloidal chemistry.

One feels a sense of inability to understand how one man could do so much in one lifetime; however, this record gives but a glimpse of that man and his activities. He also lived in another world in which he is equally highly regarded, that of American literature. The little boy who grew up along the roads of old Kentucky recorded in his mind and heart the love of the common people; the folklore and stories of his people. He made a careful study of the semi-hill dialect and then set it down in six widely read novels. Indeed he may be said to be the outstanding novelist to come out of the American pharmaceutical scene. In *Etidorhpa* or the *End of the Earth*, which appeared in 1895, he combines a knowledge of drugs and actions with a strange story of the experiences of a man in another world. This publication achieved wide acclaim, not only in the field of his own profession, but in all the literary world. By 1936 this work had gone through 18 editions.

The Right Side of the Car (1897) is a story of a sentimental journey. To the present writer *Stringtown on the Pike*, which appeared in 1900, presents the greatest appeal for here Dr. Lloyd is at his best. He knew the folklore and legends of his home region and, not unlike Washington Irving in his *Legends of Sleepy Hollow*, he knew how to tell them. Most of all he knew the village life, the old school, the country store. He knew why covered bridges were haunted and why a boy loved to feel the dust of a Kentucky road as it "squzzed up between" barefoot toes. He knew the feel of the warm, summer night on a boy's cheek as he passed by the old "graveyard." Best of all, he knew life. In 1910 he wrote *Warwick of the Knobs* and in 1903 *Red Head;* both displayed a fine understanding of the much-misunderstood feudal past of the hills of Kentucky. *Scroggins*, a story of an early and not soon forgotten love, came along in 1904.

Stringtown on the Pike

Then came *Felix Moses* (1930) the beloved Jew of *Stringtown on the Pike*, the life experiences of a unique character, a Jewish peddler who fought in the Confederate States Army. Lastly came *Our Willie* (1934), a sequel to *Stringtown on the Pike*. Few men have lived who possessed such versatility and fewer still have achieved such distinction in all their fields of endeavor.

As already pointed out Dr. Lloyd was a wide traveler. In addition to his American interests he had applied his talents to scientific work in Germany. In 1935 he made a trip to Japan.

He married Adeline Meader, December 27, 1876, who died on their honeymoon, January 1, 1877. On June 10, 1880, he married Emma

Rouse, of Crittenden, Ky. She lived until November 28, 1932. Three children were born to this union: John Thomas, born April 30, 1884, who later achieved fame as an entomologist and pharmaceutical manufacturer, and became President of John T. Lloyd Laboratories, Cincinnati; Annie, born November 18, 1886, married Dr. O. C. Welbourn, now resides in Encina, California; Dorothy, born October 28, 1896, married James A. Brett, Jr., of Cincinnati.

Dr. Lloyd died on April 9, 1936, at the home of his daughter, Mrs. Welbourn, at Van Nuys, California. The funeral services were held in Calvary Episcopal Church, Cincinnati, and he was laid to rest in the Hopeful Cemetery, at Florence, Kentucky, in the heart of the land where he had spent his youth and which he had made famous in his book, *Stringtown on the Pike.*

Thus comes to an end a very incomplete sketch of one of America's most noted pharmacists. The influence of his work will live so long as men continue to search for the secrets of the world of plants. His first chemical still reposes in the Smithsonian Institution at Washington, D. C. His studies and writings are being referred to and quoted by authors as of this minute (see Gordon's *Aesculapius Comes to the Colonies* [1949]). And more and more the chemists who pore over their test tubes and microscopes find that John Uri Lloyd sought for the truth and found it.

Vitamin B_{12} Admitted to U. S. P. XIII

CRYSTALLINE vitamin B_{12}, crystalline vitamin B_{12} injection, and vitamin B_{12} concentrate are being admitted to the U. S. P. XIII by Interim Revision, Dr. E. Fullerton Cook, chairman, U. S. P. Revision Committee, has announced.

The following statement (reprinted in part) and recommendation by the U. S. P. Anti-Anemia Advisory Board in reference to claims for the vitamin B_{12} activity of liver and other anti-anemia preparations have been released for the attention of physicians, pharmacists, and manufacturers of products intended for the treatment of pernicious anemia:

"It is of great importance that patients suffering from anemia and the physicians responsible for their lives should have conclusive proof not only that claims for the vitamin B_{12} content of preparations of liver, stomach, or other substances are based upon sound and scientific evidence but especially that they are genuinely translatable into clinical activity. Thus at present, as for many years past, the potency of all acceptable preparations of liver and stomach has been expressed only on the basis of clinical trial in terms of the familiar U. S. P. units."

A collaborative study for estimating the vitamin B_{12} contents in liver injection or other products intended for the treatment of pernicious anemia, now under way under the Board's supervision, has the support of the A. M. A. Council on Pharmacy and Chemistry, the Food and Drug Administration, the Canadian Department of National Health and Welfare at Ottawa, the National Institute of Medical Research at London, many other scientific investigators in this country and abroad, and numerous manufacturing laboratories. "Those now working on the liver versus vitamin B_{12} relationship will be invited to participate in this study. A crystalline vitamin B_{12} and samples of liver injection of known potency, in several dilutions, will be supplied by the Board. All assay reports will be made under code.

"In the meanwhile, until the results of this study can be evaluated and a reliable method for assaying a clinically active vitamin B_{12} has been established, the U. S. P. Anti-Anemia Advisory Board has prepared and is sending to the medical and pharmaceutical press the following recommendation which has been signed by all members of the Board, Dr. Frank H. Bethell, Dr. William B. Castle, Dr. Robert W. Heinle, Dr. Irving M. London, Dr William T. Salter, and Dr. Maxwell M. Wintrobe:

Recommendation on Claims for Vitamin B_{12}

"Although progress is being made toward the attainment of a reliable microbiological assay for the vitamin B_{12} content of commercial anti-anemia preparations, general agreement on a standardized procedure for such assays has not yet been reached. Consequently, with the exception of preparations of crystalline vitamin B_{12}, it is considered to be contrary to the best interests of patients and of the medical and pharmaceutical professions for the result of unofficial assay procedures for vitamin B_{12} to be stated on the labels of the U. S. P. anti-anemia preparations. Thus, until such time as the relation between vitamin B_{12} content or some other measurable component and the clinical and hematopoietic activity of U. S. P. anti-anemia preparations has been established, only the present U. S. P. unitage with which the medical profession is familiar should be employed. It is hoped that eventually a suitable microbiological assay procedure may entirely replace the present U. S. P. units which are based on clinical evaluation of anti-anemia potency."

New Faculty Assignments and Deanships

RECENT announcements from various colleges and universities indicate a number of changes in faculty assignments and deanships. Those changes which have been reported to the AMERICAN PHARMACEUTICAL ASSOCIATION during recent weeks are listed in the following items:

University of Maryland

Dr. Noel E. Foss, formerly assistant dean of the University of Illinois College of Pharmacy, has been appointed dean of the University of Maryland School of Pharmacy, succeeding the late Dr. Andrew G. DuMez. The new dean is a native of South Dakota and has taught at Duquesne University. He received his postgraduate training at the University of Maryland and has had extensive experience in manufacturing pharmacy. During World War II he served as a major in the Medical Administrative Corps, holding a responsible position at the St. Louis Medical Supply Depot.

University of Pittsburgh

Dr. Stephen Wilson, chairman of the A. PH. A. Committee on Social and Economic Relations, has been named vice-dean of the School of Pharmacy at the University of Pittsburgh. Dr. Wilson is professor of pharmacy at the University and is one of the few teachers in this field who has specialized in economics. He is past chairman of the Section on Pharmaceutical Economics of the A. PH. A. and has also been active as a member of the Curriculum Committee of the American Association of Colleges of Pharmacy.

University of Illinois

Dr. Frank T. Maher has been appointed assistant dean of the University of Illinois College of Pharmacy. Dr. Maher currently holds the rank of professor of pharmacognosy and pharmacology and head of the department in the College of Pharmacy. He will continue to serve in that capacity. Dr. Maher has been a member of the faculty of the University of Illinois since 1937 when he was appointed as assistant in the department of pharmacy. He was a research associate at the Mayo Clinic in Rochester, Minn., during 1947–1948.

University of Wisconsin

Dr. Melvin W. Green has been named associate professor of pharmaceutical chemistry at the University of Wisconsin's School of Pharmacy at Madison. Dr. Green comes to Wisconsin from the Laboratory of the A. PH. A., where he recently served as director and previously as chief chemist. Prior to this he was instructor of pharmacology at Georgetown University College of Medicine, Washington, D. C., assistant professor of pharmaceutical chemistry at the Cincinnati College of Pharmacy, and research assistant at the Mellon Institute of Industrial Research, Pittsburgh, Pa.

University of Connecticut

Dr. Arthur E. Schwarting has been appointed associate professor of pharmacognosy at the University of Connecticut College of Pharmacy. Dr. Schwarting has been associated with the University of Nebraska since 1943 where he held the position of chairman of the department of pharmacognosy. In his new position he will direct the research and graduate program in the fields of pharmacognosy and botany. Dr. Schwarting has been active in the American Association of Colleges of Pharmacy, the American Association for the Advancement of Science, and the AMERICAN PHARMACEUTICAL ASSOCIATION.

Drake University

Dr. Byrl E. Benton of Chicago has been appointed dean of the Drake University College of Pharmacy at Des Moines, Iowa. Dr. Benton has been serving as associate professor of manufacturing pharmacy at the University of Illinois College of Pharmacy since September, 1947. He also was in charge of hospital pharmacies at the University of Illinois Research and Educational Hospitals and the Illinois Eye and Ear Infirmary.

College of the Ozarks

Dr. Kenneth Redman has assumed his duties as dean of the School of Pharmacy at the College of the Ozarks, Clarkesville, Ark. Dr. Redman comes to Ozarks from the University of Georgia. He previously taught at the University of Toledo, the North Dakota Agricultural College, the University of Mississippi and the University of Georgia. Dr. Redman is chairman of the A. PH. A. Section on Historical Pharmacy.

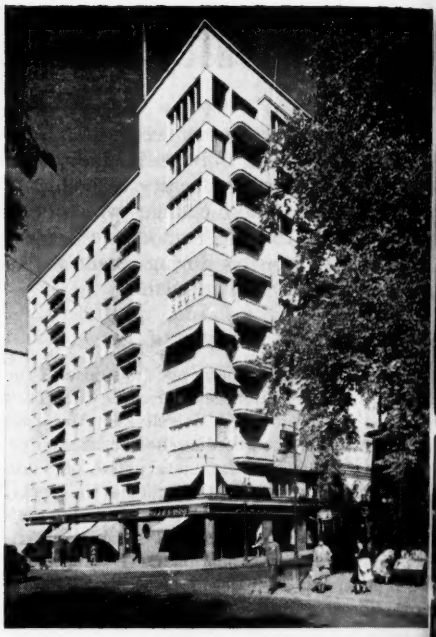
University of Georgia

Appointment of Dr. Joseph P. LaRocca as associate professor of pharmacy at the School of Pharmacy, University of Georgia, was recently announced. A native of Pueblo, Colo., Dr. LaRocca has taught at the University of Maryland and the U. S. Army University Center at Florence, Italy. For the past two years Dr. LaRocca has been with the Naval Research Laboratory, Washington, D. C.

(Continued on Page 575)

Pharmacy in Finland

*by Bernard Aabel**



Pharmacy is housed in modern Finnish building

PHARMACY is practiced on a very high professional plane in Finland. To obtain a license to practice, the Finnish pharmacist must receive from five to six years of university training and, in addition, have four years of practical work. Even then, the Finnish pharmacist, as a rule, cannot operate his own establishment immediately.

Finnish pharmacies are all privately owned but regulated by the Government. When an owner dies, the Government grants a license to the senior eligible pharmacist who has the money and desire to buy the pharmacy.

There are 448 pharmacies in Finland, 33 of which are located in Helsinki. With a population of nearly four million people, Finland has a pharmacy for every 8000 persons.

Finnish pharmacists are highly respected in the community and looked upon as members of a most important health profession.

Another interesting sidelight is the fact that 50 per cent of the pharmacists in Finland are women and 25 per cent of the pharmacies in that country are owned by women. This is not too surprising since Finland claims it is the first country to give universal suffrage to women.

Although there are no minimum prices, the Government sets maximum prices on all medicines. Thirty to 40 per cent of the business volume is from prescriptions. Fifty-five per cent of the prescriptions are made up by the pharmacist, and the balance comprises various specialties.

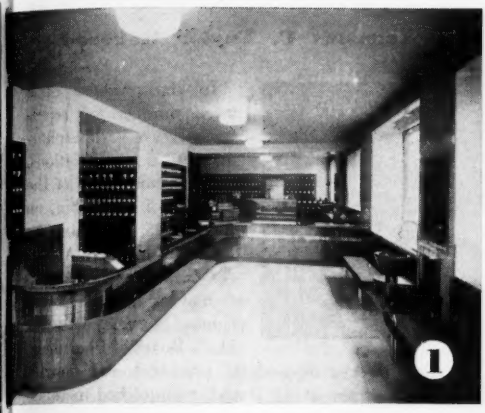
Almost all the raw materials for pharmaceuticals are imported, and because of the lack of foreign exchange, there is only a two- to three-month supply on hand. However, all the latest drugs and biologicals are in stock, including penicillin.

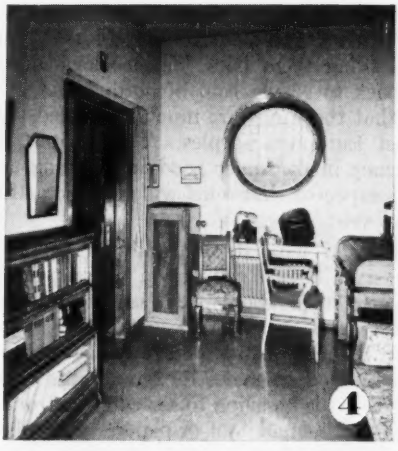
Finnish hospitals are among the most modern and efficient in the world. The

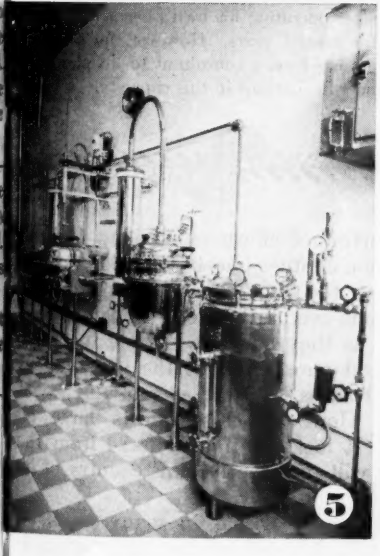
Pictures of Finnish Pharmacy

Pictures of one of Finland's modern pharmacies, published with this article, were supplied by the author. Note the up-to-date fixtures, equipment and apparatus, the well-stocked shelves and totally professional appearance.

* Lt. Col. Bernard Aabel, Medical Service Corps, U. S. A., and formerly liaison officer of the Surgeon General to the A. PH. A. Committee on War Activities, is attached to the American Legation at Helsinki, Finland. In a communication to A. PH. A. Secretary Robert P. Fischelis, Lt. Col. Aabel gave his observations on the practice of pharmacy in Finland from which the foregoing comments are taken.







1. *Interior of pharmacy.* 2. *Prescription stock.* 3. *Another view of prescription laboratory.* 4. *A view of the pharmacist-owner's office.* 5. *Laboratory equipment used by the pharmacy.* 6. *Dispensing and compounding laboratory.*

Finnish Government hopes in the future to set up research laboratories for pharmacology, biology, and chemistry in addition to sponsoring foreign study trips.

However, with huge funds being expended to resettle 500,000 refugees from Carelia (one of the territories ceded to Russia), reconstructing the towns, bridges, and highways ravaged by the retreating Germans in Northern Finland and Lapland, paying $300,000,000 to Russia in reparations by 1952, and otherwise adjusting the economy after almost continuous war from 1939–1944, Finland already is involved in a Gargantuan undertaking. However, since three-fourths of the reparations have now been delivered, the little country faces a brighter future.

Inflation is rampant here as everywhere, and life is fraught with deficiencies, but the hard work and perseverance of the Finns will bring them back. The caloric intake is back to 95 per cent of normal, but even at that the Finns are much better fed than most European peoples. The greatest deficiency in consumer goods is clothing, but it is expected that relief will come sometime next year.

Finland with its four million people is the sixth largest country in Europe, and is covered throughout with continuous pine forests and 60,000 lakes. It is this "green gold" of the forests that is making it possible for Finland to make its remarkable comeback. It is amazing to see what improvisation can be made out of paper. In Finland the hotels are using paper sheets (they rustle like a forest of oak leaves in a hurricane), paper rugs (good-looking designs that last five to six years), string, and even schnapps made from wood.

Finns Keep Democratic Principles

These people become more determined every day to retain their democratic principles. The Communists lost heavily in the national elections last year, and are not now participating in the Cabinet at all. They were offered minor posts in a coalition government, but refused to participate without getting the portfolio of Ministry of Interior (which included the State Police). The Social Democrats established a Government without rightists and leftists in a determined effort not to allow Finland to become another Czechoslovakia.

During the past year the Communists have made every effort to start nation-wide strikes, as they have in France, to create chaos and unrest, unseat the Government and embarrass it in the eyes of the Soviet Union. However, these efforts have all failed. It looks as if only force from the outside will ever deprive this country of its democracy.

The popular notion in many countries that Finland is behind the iron curtain is certainly untrue. It is intensely interesting to watch the heroic struggle being put up by these people to make democracy work.

Augustus C. Taylor Honored

In the presence of a large number of representatives of various pharmaceutical associations, the Commissioners of the District of Columbia, on August 25, presented an Award of Merit to Augustus C. Taylor in recognition of his 45 years of continuous service with the D. C. Board of Pharmacy.

Dr. Taylor, 80-year-old president and charter member of the D. C. Board, relinquished membership on the Board on July 1.

A life member and former honorary president of the AMERICAN PHARMACEUTICAL ASSOCIATION, Dr. Taylor declined reappointment on the D. C. Board because of his advanced age.

One of the original delegates to the National Drug Trade Conference, Dr. Taylor served as vice-chairman of that group for several years.

Dr. Taylor helped draft the Pure Food and Drug and the Harrison Anti-Narcotic Acts. He also assisted in writing the District's pharmaceutical law, and has edited numerous publications in the field of pharmacy.

He began his pharmacy career by working summers in the apothecary shop of his great-grandfather, Dr. Jere Carrier, a surgeon mate in the American Army during the War of 1812.

Dr. Taylor, a native of Detroit, has made the Nation's capital his home since 1878. He retired in 1925 after operating his own pharmacies in the District for several years. However, for the past 20 years he has been a consultant to Peoples Drug Stores, and will continue in this capacity.

science news capsules

ELECTRICAL SIGNALS from the brain and heart can now be used to give warning when an anesthetized patient is in danger. Signs of approaching death are given two minutes earlier by a brain wave machine than by the breathing and pulse rates usually observed, a Mayo Clinic team reported to the recent meeting of the American Medical Association.

BOVINE TUBERCULOSIS infection has been reduced to less than one-half of 1% in every county in the United States, according to the Bureau of Animal Industry. The Bureau still is trying to produce a better tuberculin to aid in solving the problem of no-visible-lesion reactors.

POISON IVY poisoning is responsible for more than $8,000,000 being spent annually in the United States for treatment, according to *Modern Medicine Topics* (June, 1949). Although the annual total number of cases is not known, ivy poisoning results in more than 465,000 medical calls each year and about 90,000 hospitalizations, the publication states.

CURARE is bringing relief to persons suffering from rheumatoid spondylitis. Use of the preparation, *d*-tubocurarine suspended in oil and wax, has been reported by Dr. Bernard M. Norcross of the University of Buffalo Medical School (*J. Am. Med. Assoc.*, **140**: 397, 1949).

SHIPMENTS of radioactive and stable isotopes have totaled 8363 during the three years of existence of the Isotopes Division of the Atomic Energy Commission. Also, to date over 1850 scientific and technical publications describing isotope studies have been issued, with approximately 200 papers being published each month.

TWO CASES of bubonic plague reported in New Mexico are the first cases of the once-dread disease in this country since 1947, records of the U. S. Public Health Service show.

LUPULON is the name of a new antibiotic having tuberculosis-fighting qualities in mice. Derived from hops, its anti-TB action has been reported by Drs. Yin-Ch'an Chin and Hamilton H. Anderson of the University of California Medical School. Whether the antibiotic can reverse the symptoms of the disease has not been determined yet.

THE IBEX, heavy-horned wild goat of the Alps, is being re-established in the mountains of Germany and Austria, where it was exterminated by overhunting many years ago. Medico-magical superstitions were partly responsible for the beast's extermination since, even in early modern times, strange powers have been accorded to "bezoar stones," hardened hair-balls sometimes found in the animals' stomachs.

TOXIC GOITER, for which surgery, x-ray therapy or antithyroid drug therapy is unsuitable, can be successfully treated with radioactive iodine, four Los Angeles researchers have reported. (*J. Am. Med. Assoc.*, **140**: 1082, 1949.) Sixteen out of 18 cases of the disease were successfully managed by administration of the chemical.

FLORIDA, long engaged in a battle of superlatives with California, now must defend a fishing claim against scientific opinion. Dr. Carl H. Hubbs of the Scripps Institution of Oceanography and Dr. Reeve M. Bailey of the University of Michigan, state that Florida's claims for record smallmouth bass are erroneous. The fish are largemouth bass, not smallmouth, the scientists claim.

MANY CLAIMS now being made for ammoniated dentifrices are not warranted by present clinical trial evidence, stated the August issue of the *Journal of the American Dental Association.* The *Journal* said that while preliminary reports have indicated that the ammoniated preparations may help prevent decay, it will be another year or longer before sufficient tests will have been carried out to provide a proper evaluation of the new products.

QUINOLINE DIPHOSPHATE, a synthetic antimalarial, has proved quite successful in the treatment of a cattle disease known as anaplasmosis, Dr. Herman Farley of Oklahoma A. and M. College recently reported to the American Veterinary Medical Association. Losses from anaplasmosis, often confused with cattle tick fever, are estimated at $4,000,000 a year in the United States alone, Dr. Farley said.

COMBINING Benadryl with sulfamethazine brought rapid improvement in 40 babies suffering from infant diarrhea, Dr. C. Zahra Neumann of the Royal Malta University reports in the *British Medical Journal* (July 16, 1949, p. 132). Dr. Neumann believes that the symptoms of the disease can be explained, at least in part, as a manifestation of histamine intoxication.

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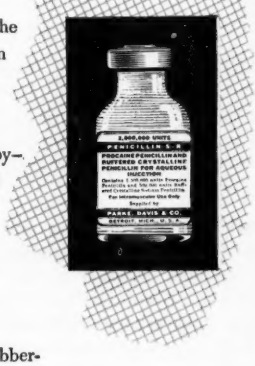
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PERCENTAGE STRENGTH PENICILLIN SOLUTIONS

by
Wm. P. O'Brien*

FOR ease of preparation, speed and accuracy, the writer offers the following method for use in the preparation of solutions of penicillin of various percentage strengths.

One need only remember that a Penicillin Unit is defined as the penicillin activity contained in 0.6 microgram of the Food and Drug Administration's master standard which is approximately equivalent to one Oxford Unit. Therefore, one milligram of penicillin will contain 1666.6 units. For preparing solutions of percentages of penicillin the pharmacist need only determine the number of milligrams of the salt necessary to make the required per cent and then multiply this figure by 1666.6 in order to obtain total number of penicillin units in solution.

The following prescription will serve to demonstrate the method.

℞
Sol. penicillin G sodium
0.5%..... 15.0 cc.
Sig. Two drops O. U. every
2 hours.

To make 15 cc. of a 0.5% solution of any salt, 75 mg. are required. To find the number of units of pencillin salt: 75 X 1666.6 equals 124,995 units.

Those pharmacists who keep a stock solution of penicillin on hand will find it an easy task to determine the number of cc. stock solution necessary to fill this prescription; e. g., 5 cc. of a stock solution of strength 25,000 units/cc. need be diluted to 15-cc. volume. The necessity for the proper handling of stock solutions of penicillin should, of course, be remembered. Crystalline penicillin in solution is unstable and should not be held more than three days at refrigeration temperature. If it is buffered it may be held for as long as seven days under refrigeration. Amorphous penicillin may be held for seven days under refrigeration, since this drug is buffered by the impurities present. The holding of stock solutions of penicillin by pharmacists for periods longer than those outlined above will result in the prescribing of penicillin solutions of improper potencies.

For those pharmacists who receive but a few prescriptions for penicillin solutions the following procedure is suggested:

Since crystalline penicillin G sodium or potassium is supplied in vials of 100,000, 200,000, 500,000 and 1,000,000 units each, the package containing 200,000 units must be used. In order to determine amount of diluent to use, find out number of units contained in each cc. of finished solution, then divide this number into number of units contained in the vial. For example, 124,995 units per 15 cc. equals 8333 units per cc.; 200,000 units (amount contained in vial) per 8333 (number of units contained in each cc. of finished solution) equals 24 cc. Therefore, the penicillin salt should be dissolved in several cc. of diluent and this solution poured into a graduate and the volume brought up to 24 cc. (The salt in this case will readily dissolve in 5 cc. of diluent, and after this solution is transferred to the graduate, several rinsings of the vial are possible with the required balance of diluent, thereby insuring complete removal of penicillin salt.)

* Chief Pharmacist of Touro Infirmary, New Orleans, La.

(*Continued on Page 576*)

SUMMARY OF ANTIMALARIAL DRUGS

by **W. CLARK COOPER***

AT LEAST a dozen chemical compounds, commercially obtainable or under large-scale investigative use, are currently being recommended for the management of malaria. All of these, except quinacrine, pamaquine, and the cinchona alkaloids, have been introduced during the past 5 to 10 years. Since the new drugs have appeared in medical literature under a variety of synonyms, including numbers and proprietary names, there is little wonder that much confusion prevails as to the identity and relative merits of the available antimalarial agents.

This summary is not intended to be a critical review of all recent advances in the chemotherapy of malaria. Original references should be consulted for detailed descriptions of the various drugs and for evidence to support the generalizations which are necessary in a summary.[1] Those familiar with the problems of making definitive comparisons of therapeutically active compounds will appreciate the need for many qualifying statements throughout the appraisals. As the characteristics of the predominant strains of malarial parasites in a given area may greatly influence the choice of drug regimens, dosage recommendations are intended to be merely representative. In all cases they refer to the oral dosage for an average adult.

It is now accepted that the early development of sporozoite-induced malaria in man takes place in fixed-tissue cells, as has been demonstrated for *Plasmodium vivax*. It is further believed that persistent fixed-tissue forms, not yet actually demonstrated histologically, are responsible for the repeated relapses of *P. vivax* and *P. malariae* infections, but that such persistent forms do not occur in *P. falciparum* infections. In vivax and malariae malaria, drugs which are active only against the asexual erythrocytic parasites will stop acute attacks, or will suppress parasites and fever as long as administered, but will not prevent relapses. The actual relapse rates following such noncurative therapy will be determined by a variety of factors, including strain of parasite, intensity of exposure, and status of host resistance.

Curative chemotherapy of vivax or malariae malaria implies a significant reduction in the relapse rate, as contrasted with that following noncurative therapy, and presumably results from partial or complete destruction of persistent fixed-tissue parasites.

Protective treatment may achieve either causative prophylaxis or suppression. Causative prophylaxis implies action against the sporozoites or the succeeding pre-erythrocytic stages, prior to the first invasion of erythrocytes, and, if complete, permanently prevents infection. Suppression implies action, usually against asexual erythrocytic parasites, sufficient to keep an infection latent at least as long as the drug is being administered. It may be carried out during a period of active exposure to infection, or it may follow treatment of an acute attack.

Gametocytocidal action indicates activity against the sexual erythrocytic parasites, which are necessary for the infection of mosquitoes. Such action, theoretically of public health value, does not in itself appear to affect the clinical course of malaria in the patient being treated.

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* Surgeon, Laboratory of Tropical Diseases, Microbiological Institute, National Institutes of Health, Bethesda, Md.

Adapted from an article published in the June 10 issue of *Public Health Reports*, U. S. Public Health Service, Washington, D. C.

All of the antimalarial drugs included in the summary are rapidly absorbed from the gastrointestinal tract. In the description of each drug a brief statement will be made as to its tissue localization, i.e., its tendency to become concentrated in certain cells of the body, and its rate of elimination, either by excretion or degradation. In general, a compound which is markedly localized in tissues is more effective if loading or priming doses are given at the start of therapy. Such a compound, particularly if its rate of elimination is slow, will be long retained in the body, permitting wider spacing of individual doses, shorter courses of treatment, and prolonged periods of protection against relapse immediately following therapy.

Names included in the U. S. Pharmacopoeia or approved by the Council on Pharmacy and Chemistry of the American Medical Association, will be used as principal designations. Official designations in other countries, code numbers, and proprietary names will be included as synonyms (without capitalization).

Quinine

6-Methoxy-α-(5-vinyl-2-quinuclidyl)-4-quinolinemethanol

Salts: Sulfate of U. S. P. XIII (83% base) is the salt most commonly used in the United States; dihydrochloride (82% base) is the most soluble salt and is used parenterally. There are many other official and proprietary preparations.

Dosage:

Therapeutic: 2 Gm. per day (0.65 Gm., three times daily) for 7 days.

Suppressive: 0.65 Gm. per day.

Quinine is only slightly localized and is rapidly metabolized; plasma concentrations drop 90% within 24 hours after dosage.

The most important antimalarial action of quinine is against asexual erythrocytic parasites. This stops acute attacks, but clearance of parasites and subsidence of fever are often not as rapid as with large doses of quinacrine or the better 4-aminoquinolines. Vivax malaria may relapse as early as one or two weeks after therapy. Quinine has limited effect upon vivax and malariae gametocytes but no effect on falciparum gametocytes.

Quinine has no causative prophylactic action. When given protectively, it will usually suppress *P. vivax* and *P. malariae*, but parasites appear after drug is discontinued. It is less efficient as a suppressant of *P. falciparum*.

Quinine is also important because of the potentiation observed when it is given in combination with certain 8-aminoquinoline drugs, resulting in lowered relapse rates in vivax malaria.

Quinine may be given intravenously, but should be given slowly in a large volume of fluid. It is not well absorbed from muscle and may cause local necrosis. Therapeutic doses commonly cause cinchonism, with tinnitus, vertigo, partial deafness, visual disturbances, headache, and nausea. An occasional individual with idiosyncrasy may have severe cinchonism, urticaria, or angioneurotic edema from a single small dose.

Totaquine

Totaquine is a standardized mixture of cinchona alkaloids, which according to U. S. P. XIII contains "not less than 10% of anhydrous quinine and not less than 70% and not more than 80% of total anhydrous crystallizable cinchona alkaloids, the remainder consisting substantially of diluents." A typical currently obtainable preparation contains 50% cinchonine, 18% cinchonidine, and 10% quinine. As all of these alkaloids possess antimalarial activity, treatment with totaquine results in more economical use of the active ingredients of cinchona bark.

Dosage is similar to that of quinine, and the therapeutic efficacy is essentially the same. It can be given only orally. Some preparations may produce nausea and vomiting more frequently than does quinine.

Quinacrine

6-Chloro-2-methoxy-9-(4-diethylamino-1-methylbutylamino)acridine

Synonyms: Atabrine, atebrin, acriquine, chemiochin, chinacrin, crinodora, erion, haffkinine, italchina, mepacrine B. P., metoquina, metoquine.

Salts: Hydrochloride of U. S. P. XIII is the dihydrochloride, dihydrate (79% base).

Dosage:

Therapeutic: 0.2 Gm. of salt x 5 (every 6 hours) on day 1; then 0.1 Gm. three times daily for 6 days, a total of 2.8 Gm. in 7 days.

Suppressive: 0.1 Gm. of salt per day.

Quinacrine is markedly localized, especially in leukocytes, liver, spleen, heart, and lungs. It is slowly eliminated, so that plasma concentrations drop only about 50% per week after the last dose.

The principal action of quinacrine is against asexual erythrocytic parasites. When loading doses are given, it stops acute attacks of malaria at least as rapidly as does quinine. Persistent exoerythrocytic stages of *P. vivax* are not affected; so vivax malaria will relapse, but parasites usually do not reappear until at least 4 to 6 weeks after treatment. Quinacrine resembles quinine in being ineffective against gametocytes of *P. falciparum*.

When given protectively, quinacrine has no causative prophylactic action, but it effectively suppresses erythrocytic parasites. Such suppression, continued for a sufficient time after exposure (*e.g.*, 4 weeks), permanently prevents falciparum malaria, although resistant strains have been demonstrated. Vivax (and probably malariae) infections appear after drug is discontinued.

Quinacrine may be given intramuscularly in dosage of 0.4 Gm. and with rigid precautions it may be administered intravenously.

Although in recommended dosage quinacrine is usually well tolerated, more undesirable reactions occur than accompany treatment with 4-amino quinolines or chlorguanide. It temporarily dyes the skin yellow, but this is not a toxic reaction. It may produce anorexia, nausea, vomiting, and diarrhea, especially at the start of therapy. It is a cortical stimulant and in susceptible subjects may cause temporary mental symptoms. In a small proportion of cases, serious skin reactions occur.

Chloroquine

7-Chloro-4-(4-diethylamino-1-methylbutylamino)quinoline

Synonyms: Aralen, resochin, nivaquine B, tanakán, SN 7618, 3377 RP.

Salts: Diphosphate (62% base) for oral use; hydrochloride (89% base) for parenteral use. Nivaquine B is chloroquine sulfate.

Dosage:

Therapeutic: 1.0 Gm. of diphosphate (0.6 Gm. of base) as initial dose, followed in 6 hours by 0.5 Gm. (0.3 Gm. of base), then 0.5 Gm. (0.3 Gm. of base) once daily for 2 days, making a total of 2.5 Gm. of salt (1.5 Gm. of base) in 3 days.*

Suppressive: 0.5 Gm. of salt (0.3 Gm. of base) once weekly.

Chloroquine is markedly localized in liver, spleen, kidneys, lungs, and white blood cells. Degradation and excretion are slow; plasma concentrations drop only about 60% per week after last dose.

The principal action of chloroquine is against asexual erythrocytic parasites. It stops acute attacks of malaria promptly. It does not affect persistent exoerythrocytic stages, but vivax relapses are usually delayed until at least 7 to 10 weeks after treatment. Falciparum infections are usually cured. No data are available on quartan relapses. Gametocytes of *P. falciparum* resist chloroquine.

There is no action against pre-erythrocytic forms. Protective treatment suppresses parasites of all three species; *P. vivax* (and probably *P. malariae*) may appear after drug is stopped.

Chloroquine hydrochloride may be given intramuscularly in dosage of 0.2 to 0.3 Gm. of base. Very slow intravenous injection is still in an experimental stage.

Chloroquine produces few side-actions in recommended dosages and it does not discolor the skin. Blurring of vision, pruritus, mild headache, and gastrointestinal complaints have been reported.

Oxychloroquine

7-Chloro-4-(3-diethylamino-2-hydroxypropylamino)quinoline

Synonym: SN 8137.

Salt: Diphosphate (62% base).

Dosage: Not established.

Oxychloroquine, or SN 8137, resembles chloroquine in many respects. Although it is less toxic in man it is also slightly less active as an antimalarial. Small-scale trials in experimental and naturally acquired malaria have not shown any advantages over chloroquine. It has not been given definitive trial as a suppressant. Oxychloroquine is not commercially available.

Sontochin

7-Chloro-4-(4-diethylamino-1-methylbutylamino)-3-methylquinoline

Synonyms: SN 6911, 3038 RP, sontoquine, santoquine, santochin, nivaquine (except nivaquine B, which is a salt of chloroquine).

Salts: Disulfate, monohydrate (61% base), has been most widely used in the United States. French investigators have used various other salts, of which nivaquine C, the dihydrochloride, is preferred.

* As with all slowly eliminated drugs, single-dose therapy (0.6 Gm. of base) will prove adequate in many cases, especially if followed by a suppressive course.

Dosage:

Therapeutic: Dosages of base corresponding to those of chloroquine.

Suppressive: 0.1 Gm. of base per day; 0.3 Gm. twice weekly; or 0.3 Gm. once weekly.

Sontochin, like quinacrine and chloroquine, becomes concentrated in leukocytes, liver, spleen, and certain other body tissues; plasma concentrations decline about 25% per day after the last dose.

Like the other 4-aminoquinolines, sontochin acts against asexual erythrocytic parasites and alleviates acute attacks of malaria. Relapses of *P. vivax* can be expected at about the same intervals as after treatment with quinacrine, or sooner. It is not gametocytocidal against *P. falciparum*.

Sontochin is not a causative prophylactic but is an effective suppressant. It does not stain the skin and is well tolerated at recommended dosages. Parenteral use has been reported, but details are not available.

Sontochin is not commercially available in the United States.

SN 10,751

7-Chloro-4-(3-diethylaminomethyl-4-hydroxyanilino)quinoline

Synonyms: Amodiaquin, camoquin, miaquin, CAM-AQ1.

Salt: Dihydrochloride, dihydrate (77% base).

Dosage:

Therapeutic: Dosages of base corresponding to those of chloroquine.

Suppressive: Dosages of base corresponding to those of chloroquine; 0.6 Gm. of base every 2 weeks has also been provisionally suggested.

The drug is rapidly metabolized in the body. The degradation products are chemotherapeutically active and are slowly eliminated, plasma concentrations declining at the rate of about 60% per week.

The antimalarial activity of this drug appears to be analogous to that of chloroquine. In controlled studies, relapses of vivax malaria are delayed after SN 10,751 almost as long as after chloroquine. Falciparum infections are apparently cured.

In practical application, SN 10,751 has been shown to be well tolerated. Lassitude, anorexia, and insomnia have been described with long-continued *high daily* dosage.

This drug is not commercially available in the United States.

Chlorguanide

N_1-(*p*-Chlorophenyl)-N_5-isopropyl biguanide

Synonyms: Paludrine, proguanil B. P., M. 4888, guanatol, drinupal, palusil, tirian.

Salt: Monohydrochloride (87% base) is commonly given orally. The acetate and lactate are more soluble and are recommended for parenteral use.

Dosage:

Therapeutic: 0.6 Gm. of hydrochloride per day (0.3 Gm. twice daily) for 10 days; alternative regimen (for *P. vivax* only), single dose of 0.3 Gm., followed by suppressive course.

Suppressive: 0.3 Gm. of salt once weekly; 0.2 Gm. twice weekly; or 0.1 Gm. daily

There is considerable localization of chlorguanide in erythrocytes, leucocytes, kidneys, and liver. Chlorguanide as such disappears rapidly from the blood plasma after dosage, but there is evidence that at least part of it is converted into an active metabolic product.

In *P. falciparum* infections, chlorguanide acts as a causative prophylactic and usually cures. Some strains of *P. falciparum* show resistance to the drug to a degree which has prompted the suggestion that a more rapidly effective drug such as quinacrine be used for first day of treatment and that 0.1 Gm. of chlorguanide be taken daily for 6 weeks after therapy. Chloroquanide is an effective suppressant of *P. vivax* and there is evidence of action against pre-erythrocytic stages. All parasites are not eradicated, so that infections appear after suppression is discontinued. It alleviates acute attacks of vivax malaria over a wide dosage range but this effect is often relatively slow. Relapses of *P. vivax* occur at about the same rate and time as after quinacrine. Chlorguanide stops acute attacks of quartan malaria; no data are available on prophylaxis or cure. Chlorguanide renders falciparum gametocytes noninfective to mosquitoes.

Acquired resistance to chlorguanide has been conclusively demonstrated in the malarias of lower animals and will soon be reported for human malaria.

Chlorguanide acetate has been given intravenously in doses up to 100 mg. or 400 mg. Intramuscular injection has also been reported as well tolerated, although studies in lower animals provide evidence of local tissue damage.

The toxicity of chlorguanide is low. Dosages of 1.0 to 1.4 Gm. per day have been tolerated for 14 to 28 days without permanent ill effects. With such high dosages, nausea, vomiting, diarrhea, and mild hematuria have been described.

Pamaquine

6-Methoxy-8-(4-diethylamino-1-methylbutylamino)quinoline

Synonyms: Plasmochin, plasmoquine, praequine, gamefar, quipenyl.
Salts: Naphthoate (approximately 45% base), monohydrochloride (90% base).
Dosage:
Therapeutic: 30 mg. of base per day (10 mg. three times daily) concurrent with quinine sulfate, 2 Gm. per day (0.65 three times daily) for 14 days.
Suppressive: Not used.

Pamaquine is localized only to a moderate degree in liver, lungs, and brain, and it is quickly metabolized. Its physiological disposition is markedly altered by concurrent quinacrine or chlorguanide, leading to much higher plasma concentrations than with corresponding doses of pamaquine alone.

Pamaquine has relatively weak action on asexual erythrocytic parasites. Its practical usefulness results from the fact that it will destroy the persistent forms responsible for vivax relapses, an effect which is enhanced by the concurrent administration of quinine. Dosage of the order recommended above reduces relapse rates of naturally acquired vivax malaria but will not cure early heavy infections.

In toxic dosage pamaquine will destroy the pre-erythrocytic forms of *P. vivax* and *P. falciparum* but this action is only of theoretical interest, as an effective dosage cannot be long tolerated.

Small doses of pamaquine (*e.g.*, 10 mg. three times daily for 5 days) will eliminate gametocytes of *P. falciparum*.

Pamaquine regularly produces methemoglobinemia which, if of sufficient degree (5 to 10% of total hemoglobin), will be accompanied by cyanosis; abdominal cramps are common. Acute intravascular hemolysis is an infrequent but serious reaction, more common in Negroes. Concurrent quinacrine or sulfonamides should be avoided with all 8-aminoquinolines.

Pentaquine

6-Methoxy-8-(5-isopropylaminoamylamino)-quinoline

Synonym: SN 13,276.
Salt: Phosphate (75% base).
Dosage:
Therapeutic: 60 mg. of base per day (10 mg. every 4 hours) or 30 mg. of base per day (10 mg. every 8 hours), given concurrently with quinine sulfate 2 Gm. per day (0.65 Gm. three times daily) for 14 days.
Suppressive: Not used.

Like pamaquine, pentaquine is rapidly degraded in the body. There is apparently only slight tissue localization. Concurrent quinine results in slightly higher plasma levels, but concurrent quinacrine produces greatly elevated plasma concentrations of pentaquine.

Although pentaquine has activity against the asexual erythocytic parasites of *P. vivax*, its real usefulness depends upon its ability, especially when given in combination with quinine, to lower the relapse rate of vivax malaria. The higher dosage given above is necessary for cure of heavy early experimental infections but the lower dosage has lowered relapse rates of late, naturally acquired infections. The optimal dosage of concurrent quinine is not yet defined.

In very high dosage, pentaquine is a causative prophylactic against *P. vivax*, but its unsuitability for prolonged administration precludes such use in the field.

Pentaquine will produce a moderate elevation in methemoglobin, roughly proportional to dosage, so that some patients will exhibit cyanosis. Abdominal cramps, anorexia, nausea, vomiting, or drug fever may occur. Acute intravascular hemolysis is a potential hazard. Patients on the higher dosage should be hospitalized; those on the lower dosage may be ambulatory, but should be closely observed.

Isopentaquine

6-Methoxy-8-(4-isopropylamino-1-methylbutylamino)quinoline

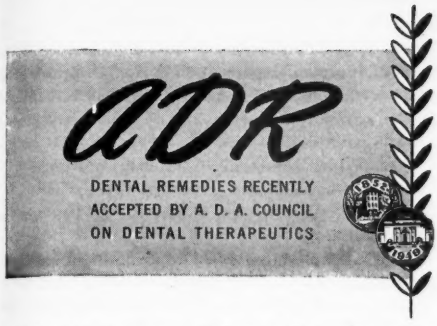
Synonym: SN 13,274.
Salt: Mono-oxalate (74–79% base).
Dosage:
Therapeutic: Same as that of pentaquine.
Suppressive: Not used.

Isopentaquine is a close analogue of pentaquine. When given concurrently with quinine it is equal to pentaquine in reducing the relapse rate of experimental vivax infections and is somewhat less toxic. It is not commercially available.

Conclusions

Most of the newer compounds have not been studied under sufficiently varied conditions to warrant final conclusions as to their relative merits, but several of them appear to

(Continued on Page 559)



Admission to Accepted Dental Remedies *means that a product and the methods by which it was marketed at the time of consideration were not found to be in violation of the published rules of the Council on Dental Therapeutics. A summary of the rules appeared in This Journal, 7:153 (April), 1946. Accepted products are reconsidered periodically.*

ANESTHETICS—LOCAL[1]

Procaine HCl 4%, Epinephrine 1:50,000—Abbott: Each cc. is stated to contain procaine HCl, 0.04 Gm.; epinephrine, 0.00002 Gm.; sodium bisulfite, 0.001 Gm.; potassium sulfate, 0.0025 Gm.; sodium formaldehyde sulfoxylate, 0.0005 Gm.; in distilled water. Marketed in 2-cc. ampuls. Manufactured by *Abbott Laboratories, North Chicago, Ill.*

BARBITURATES[2]

Pentobarbital Sodium, U. S. P. (See *Accepted Dental Remedies*, ed. 14, p. 25.)

Pentobarbital Sodium Capsules 3/4 gr., 1 1/4 gr. (Pembules).

Pembrin: Each tablet is stated to contain pentobarbital, 9/20 gr., and aspirin, 5 gr. Manufactured by *Novocol Chemical Mfg. Co., Inc., Brooklyn.*

Nembutal Sodium: A brand of pentobarbital sodium, U. S. P.

Sterile Powder Nembutal Sodium: Marketed in ampuls, 0.25 Gm., 5 cc.; 0.5 Gm., 10 cc. and in vials, 0.5 Gm., 20 cc.

Capsules Nembutal Sodium, 1/2 gr., 3/4 gr., 1 1/2 gr.

Sterile Solution Nembutal Sodium, 0.25 Gm.: Each 5 cc. is stated to contain nembutal sodium, 0.25 Gm.; propylene glycol, 1 cc.; alcohol, dehydrated, 0.5 cc., and water for injection, to make 5 cc. Marketed in 5-cc. ampuls.

Sterile Solution Nembutal Sodium, 50 mg. per cc.: Each cc. is stated to contain nembutal sodium, 50 mg.; propylene glycol, 0.2 cc.; alcohol, dehydrated, 0.1 cc., and water for injection, to make 1 cc. Marketed in 50-cc. multiple dose vials.

Suppositories Nembutal Sodium, 1/2 gr., 1, 2 and 3 gr.

Nembutal: A brand of pentobarbital.

Elixir Nembutal: Each fluidounce represents the equivalent of nembutal sodium, 2 gr.; alcohol, 25%; saccharin; flavor; Yerba Santa base; sweetose liquid, and caramel. Marketed in 4-fluidounce, one-pint and one-gallon bottles.

Capsules Nembutal and Aspirin: Each capsule is stated to contain nembutal sodium, 1/2 gr. (as nembutal, 29.6 mg.); acetylsalicylic acid, 5 gr.; corn starch, 51 mg.

Nembutal Calcium: A brand of pentobarbital calcium.

Tablets Nembutal Calcium, 1/2 gr., 3/4 gr., 1 1/2 gr.

Enterab Tablets, Nembutal Calcium, 3/4 gr., 1 1/2 gr. Manufactured by *Abbott Laboratories, North Chicago, Ill.*

FLUORINE-CONTAINING SUBSTANCES[3]

Flursol: Each 100 cc. contains sodium fluoride, 2 Gm., in distilled water. Distributed in plastic containers (2 oz.) or wax-lined bottles (1 quart). Manufactured by *Novocol Chemical Mfg. Co., Inc., Brooklyn, N. Y.*

ANTIBIOTICS AND ANTISEPTICS[4]

Rapid/Repository Penicillin (Crystalline Penicillin G Procaine and Buffered Crystalline Penicillin G Potassium for Aqueous Injection): Each single-dose vial is stated to contain crystalline penicillin G procaine, 352,450 units; crystalline penicillin G potassium, 117,500 units; sodium citrate; sodium carboxymethylcellulose, and Tween 80. In 1-, 5- and 10-dose vials. Manufactured by *Abbott Laboratories, North Chicago, Ill.*

Penicillin G Potassium Chewing Troches, 20,000 Units: Stated to contain penicillin G potassium, paraffin wax, lactose, saccharin, color and flavor. In boxes of 6.

Penicillin G Potassium Troches Soluble, 5000 Units: Stated to contain penicillin G potassium, karaya gum, magnesium stearate, acacia, mineral oil, sucrose powder and flavoring. In boxes of 24 and 100. Manufactured by *E. R. Squibb & Sons, New York City.*

DRUG THERAPY IN ENDODONTIA: *QUESTIONS AND ANSWERS**

Q. For what purposes are drugs or chemicals used in endodontia?

A. With the possible exception of oral surgery, drugs will be employed more frequently in endodontia than in any other phase of dental practice.

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[1] See *Accepted Dental Remedies*, ed. 14, p. 39.
[2] See *Accepted Dental Remedies*, ed. 14, p. 22.
[3] See *Accepted Dental Remedies*, ed. 14, p. 70.
[4] See *Accepted Dental Remedies*, ed. 14, p. 59.

* Abstracted from a report by F. D. Ostrander, D.D.S., M.S., Ann Arbor, Mich., prepared for the Council on Dental Therapeutics of the American Dental Association. (*J. A. D. A.*, 39: 238, 1949.)

The following are purposes for which the endodontist will use drugs or chemicals: (1) Preoperative sedation. (2) Control of pain during pulpectomy or root resections. (3) Occasionally for enlargement or dehydration of the pulp canal. (4) Irrigation and washing of the pulp canal to remove organic material and debris. (5) Disinfection of the pulp canal and periapical areas. (6) Systemically, on occasion, for the control of severe fulminating periapical infections. (7) Control of pain following endodontic procedures.

Q. What drugs should be used preoperatively?

A. The drugs best suited for this purpose are the barbiturates. It has been clearly demonstrated that barbiturates oppose the toxic effects of local anesthetics and generally reactions to them will be minimized or eliminated by proper premedication. The choice of the barbiturate and the dosage will depend upon the individual patient and conditions. In general a rapidly acting barbiturate of brief duration which causes few side reactions is to be desired. Members of the barbiturate group generally suitable include pentobarbital sodium, 0.1 to 0.2 Gm.; hexobarbital (*Accepted Dental Remedies*), 0.13 to 0.26 Gm.; Seconal sodium (*New and Nonofficial Remedies*), 0.1 to 0.2 Gm.

Q. What local anesthetic solutions are suitable for use in endodontia?

A. Any of the numerous anesthetic preparations which are listed in *Accepted Dental Remedies* are suitable for use in endodontia. In certain instances such as the extirpation of painful hyperemic pulps which are difficult to anesthetize, the use of the 4% procaine solutions which are listed in A. D. R. may be desirable. However 2% procaine or 1 or 1½% butethamine (Monocaine) hydrochloride solutions will be entirely adequate for routine use.

Q. What agents are best suited for the chemical enlargement of root canals?

A. Phenolsulfonic acid, sulfuric acid and hydrochloric acid are most frequently used. Concentrated sulfuric acid should not be employed because of its extremely corrosive action. It is usually used in concentrations of 30 to 50% and hydrochloric acid is most commonly used in 30% strength. At the University of Michigan, School of Dentistry, phenolsulfonic acid made according to the following formula is preferred:

Concentrated sulfuric acid.....	97 cc.
Phenol crystals.....	90 Gm.

Hold at 100° C. for 20 hours.

The above preparation is not as caustic or destructive as sulfuric acid and has a syrupy consistency which makes it relatively easy to handle.

After any acid is used for root canal procedures it must be neutralized and this is most commonly done with a suspension or solution of sodium bicarbonate.

Q. What drugs are suitable for irrigating and washing root canals?

A. Probably the most effective drug for this purpose is sodium hypochlorite solution U. S. P. or one of its modifications such as Labarraque's solution or "Hychlorite" A. D. R. It has the advantages of being mildly antiseptic and of being noninjurious to the periapical tissues.

Q. Which commonly used drugs are most suitable for root canal and periapical antiseptics?

A. The following are among the better ones for general use:

(1) Camphorated *p*-chlorophenol; prepared by triturating 21 Gm. of camphor with 9 Gm. of *p*-chlorophenol. The antiseptic is not injurious to the periapical tissues and is highly effective clinically.

(2) Chloroazodin U. S. P. ("Azochloramid") in a 1% solution in triacetin is effective but may discolor anterior teeth and sometimes produces a copious exudate in the root canals even after they become sterile. However, its effectiveness and bland character justify its inclusion in the armamentarium of the endodontist.

(3) Beechwood creosote is effective and relatively nonirritating but it has such a strong odor and taste that its use is decreasing. However, it deserves a place as an alternate drug when others are not effective.

This list of drugs is not intended to be complete. Many may make rational use of other drugs. Such caustic and irritating preparations as formaldehyde-cresol mixtures and iodized phenol are purposely omitted from the list. Their routine use is contraindicated because of their injurious effect on periapical tissues.

Q. What is the status of the sulfonamides for topical use in treatment of root canal and periapical infections?

A. It is the experience of the author that the sulfonamides are inferior to commonly used antiseptics. There is no reason to believe that the sulfonamides should be used extensively in topical root canal therapy.

Q. What is the present status of the antibiotics for topical treatment of root canal and periapical infections?

A. Such use of the antibiotics has not yet been adequately evaluated but there is reason to believe that certain members of this group may have some value, either alone or in combinations. Reports on penicillin have been conflicting, which may be due in part to the fact that many strains of organisms isolated from root canals are penicillin-resistant. Best results have generally been reported with high concentrations of penicillin. A combination of penicillin and streptomycin may be more effective than penicillin alone. Using strong suspensions of penicillin the author and his associates did not obtain results equivalent to those obtained with more commonly used drugs, but in a study now being conducted in which a strong suspension of penicillin and streptomycin is being used, preliminary results have been much better.

The following tentative conclusions are justified: (1) Penicillin-resistant organisms are frequently en-

countered in root canals, making the routine use of penicillin alone inadvisable. In any case which does not respond readily to penicillin other drugs should be substituted. (2) To be most effective in root canal therapy the antibiotics must be used in high concentration. (3) Because of the frequent presence of resistant organisms it is probable that combinations of antibiotics will be desirable to increase the range of effectiveness. (4) Penicillin and streptomycin are only two of many antibiotics. Other members of this group or combinations may be found superior to either penicillin or streptomycin.

Q. Is a special culture medium required when penicillin or other antibiotics are used in the treatment of root canal or periapical infections?

A. Yes. When penicillin is used in root canal treatments a culture medium should be used which will neutralize any penicillin which is carried into it from the tooth. The most commonly used agent for this purpose is penicillinase which is added to the medium in concentration of approximately 0.66 Schenley unit per cc.

Q. What drugs are useful in the control of the pain which occasionally follows endodontic procedures?

A. For the milder types of pain the use of the antipyretic group will usually suffice. Acetylsalicylic acid is the safest of this group. The official dose is 0.3 Gm. but most adults may be given a 0.6-Gm. initial dose followed by 0.3 Gm. every hour if needed. Acetophenetidin may be used when aspirin does not control the pain but it is potentially more toxic and therefore must be used with greater caution. The dose is 0.3 Gm. and may be repeated at intervals of 3 hours. Whether mixtures of acetylsalicylic acid, acetophenetidin and caffeine are superior to the individual drugs is not clearly established. However, analgesics should not be prescribed or dispensed in a way that will encourage the patient to use them for self-medication.

When the more severe types of pain occur, codeine orally is best suited for the ambulatory patient. The official dose is 0.03 Gm. but it may be desirable to give 0.06 Gm. to adults to be followed by 0.03-Gm. doses at intervals of 3 hours when pain is severe. Some clinicians prefer to give codeine in combination with acetylsalicylic acid or acetophenetidin. They may be given together by prescription or they may be alternated. Morphine, 8 to 10 mg., is more effective for the control of severe pain but is not desirable for the ambulatory dental patient because of its side effects. Some substitutes for morphine are now under clinical trial but they are not yet evaluated for use in dentistry.

Malaria Authority Joins W. H. O.

Dr. G. Robert Coatney, malaria authority of the U. S. Public Health Service, has been appointed an adviser to the Expert Committee on Malaria of the World Health Organization, which met at Geneva, Switzerland, August 10 to 17.

SUMMARY OF ANTIMALARIAL DRUGS

(Continued from Page 556)

be superior to either quinacrine or quinine. The data at hand permit the following conclusions:

1. *Treatment of acute attacks of malaria.* Quinine, quinacrine, chloroquine (and analogous 4-aminoquinolines), and chlorguanide, when given in adequate dosage, will nearly always stop acute attacks of malaria. Choice of drug, therefore, depends upon such factors as rapidity of effect, incidence of side-actions, length of treatment period, incidence of falciparum relapses, latent periods before vivax relapses, natural or acquired strain resistance, and the cost and availability of drug. Chloroquine is superior in most of these respects and is currently regarded as the drug of choice for routine therapy.

2. *Suppression of malaria.* The aforementioned drugs, when given in properly spaced doses, will usually keep malaria latent under conditions of exposure in the field or following therapy of an acute attack. Choice of drug depends upon the incidence of break-throughs and of undesirable side-actions, the required frequency of dosage, and the persistence of protection if doses are missed, as well as upon cost and availability. Chloroquine in weekly dosage has proved to be a satisfactory suppressant, but further comparative trials are needed to determine the relative merits of chloroquine, chlorguanide, and the less well known 4-aminoquinolines.

3. *Cure of vivax malaria.* In relapsing vivax malaria, concurrent treatment with quinine and an 8-aminoquinoline, such as pamaquine, pentaquine, or isopentaquine, offers the best chance of radical cure. Pentaquine and isopentaquine afford greater margins of safety between effective and toxic dosages.

REFERENCE

1. Space limitations make it impossible to publish the author's extensive references. Readers interested in the detailed descriptions of the various drugs and in evidence to support the author's generalizations should obtain a copy of the June 10, 1949, issue of *Public Health Reports* from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.—Price 10 cents.

he public's health-- your first concern

THE HEART AND HEART DISEASE

No. 1 in a Series

• • • • • • •

THE heart, that powerful dynamo which services the body with blood carrying food and oxygen, weighs only about 10 ounces. Yet each day it performs a prodigious feat, beating over 100,000 times to pump 10 tons of blood through miles of circulatory vessels to meet the body's needs. During a lifetime of 70 years it expands and contracts about 2,500,000,000 times. If it were to stop for more than a few minutes, the body would die.

The heart is a hollow muscular organ, the size of a fist, situated within the chest. Enclosed in a fibrous sac, called the pericardium, it is divided into two halves, the left and the right, by a vertical septum or partition. Each of these halves is again subdivided into two chambers, an auricle and a ventricle, which are connected by valves. Blood leaves the right ventricle, and enters the pulmonary artery to be carried to the lungs where it rids itself of carbon dioxide and takes on oxygen for delivery to the body cells. From the lungs it flows to the left auricle through the pulmonary veins, passes to the left ventricle and on to the body through the aorta. Picking up carbon dioxide and other wastes from the various parts of the body, the blood returns through the venae cavae to the right auricle. It then flows to the right ventricle to begin again the continuous cycle. The time consumed for a complete circuit averages about 12 seconds.

The range of variation in normal hearts is great. Perfectly normal hearts may differ considerably in size, in shape, and in action. Weight may vary from 200 to 400 grams; pulse rate from 35 to 100 at rest, increasing on exercise to rates of 200; systolic blood pressure may range from 90 to 150 millimeters of mercury and diastolic pressure from 60 to 90; and cardiac output from 2.95 to 4.61 liters per minute. The normal heart output varies with the state of health, altitude, emotional disturbance, amount of exercise, and pregnancy. Thumping, skipping, and extra beats often occur from excitement, effort, or stimulants. Murmurs are common in persons with normal hearts.

The latitude of variation in the normal heart makes detection of heart disease from small physical or functional differences difficult. Further complicating the recognition of a cardiac ailment is the fact that there are no absolutely typical symptoms which always reveal its presence. For while there are many symptoms and signs which may indicate heart disease, these same symptoms and signs may arise from other causes. Their presence may or may not mean heart disease. Since only a physician can determine whether or not heart disease is present, it is important that persons presenting persistent symptoms which *may* indicate heart disease receive a correct diagnosis. Pharmacists can perform a singular service by advising such individuals to seek medical advice.

There are many common complaints associated with heart disease: Palpitation, shortness of breath, swelling of the legs, chest pain, fatigue, dizziness, fainting, insomnia, headache, and difficulties in digestion. Yet none of these are exclusive indicators of heart disease. For example, palpitation may be related to nervousness; breath-

(Continued on Page 575)

INFORMATION SERVICE

Members of the American Pharmaceutical Association are invited to submit their professional problems to the Journal, 2215 Constitution Ave., N. W., Washington 7, D. C., giving all pertinent details. Advisory service is provided by the A. Ph. A. library and technical staff and the Journal panel of technical consultants.

SOURCE OF TWEEN 80

Please inform me who manufactures an emulsifying agent known as "Tween 80."—N. S., India

"Tween 80" may be purchased from the Atlas Powder Co., Wilmington, Del.

PAS SUPPLIER

Please name a supplier for PAS (p-amino salicylic acid).—G. V., Spain

p-Amino salicylic acid is available from the Calco Chemical Division of the American Cyanamid Co., Bound Brook, N. J.

DIFFICULTY IN COMPOUNDING

What procedure should be followed in compounding the following prescription?

Saturated solution thymol
Hydrogen dioxide
Glycerin
Potassium chlorate, of each ʒii
Paint lesions in mouth t.i.d.
—O. G., California

The difficulty with the filling of this prescription is the relative insolubility of potassium chlorate. Potassium chlorate is said to be soluble 1 in 16.5 although there is some reason to believe that it is less soluble than this.

The glycerin will enhance the solubility slightly but not enough to permit the prescription to be filled. It would take a total volume of somewhat over 2 oz. of water to dissolve this amount of potassium chlorate. The prescriber should do one of two things—either permit you to saturate all of the fluids with potassium chlorate or should permit it to be diluted considerably with water.

SPRAY-TOP BOTTLES

I would like to know where I can oblain the soft plastic, spray-top bottle now being used in the cosmetic field.—A. S., New Jersey

The spray-type container which you mention is available from the Bakelite Corp., 30 E. 42nd St., New York 17, N. Y. It is our understanding that the spray attachment is in the collar of the bottle and is sealed in after the container is filled.

SUBY SOLUTION FORMULAS

Can you supply a formula for Suby Solution and Suby Solution G? What is the difference between the two?—M. G., Oklahoma

There are several Suby Solutions, including Suby Solution G. These are discussed in a review article in the *Bulletin of the American Society of Hospital Pharmacists*, **5**: 208 (1948), where the following formula is given for Suby's Solution:

Sodium citrate	18.9 Gm.
Citric acid	19.0 Gm.
Distilled water, *q. s. ad*	1000.0 cc.

The formula for Suby Solution G is:

Citric acid	32.3 Gm.
Magnesium oxide, anhydrous	3.8 Gm.
Sodium carbonate, anhydrous	4.4 Gm.
Distilled water, *q. s. ad*	1000.0 cc.

FROM THE SECRETARY'S DIARY FOR JUNE AND JULY

18th All this day with Idaho Pharmaceutical Association Secretary Jim Lynch taking in the beauties of Idaho's mountains, lakes and countryside. The trip to Arrow Rock Dam was especially delightful. At the end of the day reached Shore Lodge at McCall on one of the Payette lakes where peace and quiet reign supreme.

19th All day meeting and greeting Idaho pharmacists arriving for the annual convention at Shore Lodge and in the evening addressing this progressive group at their annual banquet on the "Importance of the Intangibles."

20th In spite of beautiful weather and an unusually attractive location the convention hall was filled when the forty-third annual convention of the Idaho State Pharmaceutical Association came to order. Under the skillful direction of first vice-president E. B. Knopp the program proceeded expeditiously and addresses by Charles Lanwermeyer and Bert Mull were particularly interesting. At noon addressed the convention on "The New Challenge to American Pharmacy." In the evening a steak fry in the pines some distance from Shore Lodge provided pleasing diversion.

21st Now bidding goodby to Idaho pharmacists and motoring back to Boise with Richard Knowlden, State drug inspector, who probably knows more about individual pharmacies in Idaho than anyone else. On to Portland by way of the Union Pacific.

22nd An early arrival at Portland, so early in fact that the Multnomah Hotel management was still asleep and there was considerable difficulty about rooms until Oregon Pharmaceutical Association Secretary Jack Lynch got busy. Most of this day spent in the company of Mr. and Mrs. Leib Riggs, who had arranged a trip to Mount Hood with dinner at the Timberline Lodge. Fortunately the sun came through the dense fog long enough to allow us to see the top of this snow capped mountain.

23rd This day visiting prescription pharmacies in Portland and meeting with Kappa Psi and the North Pacific A. PH. A. Branch officers, going over next season's program and membership campaign.

24th In the morning attending the meeting of the Oregon State Pharmaceutical Association and listening to addresses by Bert Mull, Mrs. Doris Rae Alexander, Secretary, Women Pharmacists of Oregon, and Stewart F. Lamb of the U. S. Treasury Department. At noon addressing a combined luncheon of the Oregon Veteran Druggists, the Oregon Pharmaceutical Association, Lambda Kappa Sigma and the Women Pharmacists of Oregon. Here Dr. A. G. Bettman presided in friendly fashion. In the evening attending the annual banquet of the Oregon Pharmaceutical Association and leaving in time to board the train for Butte with prospects of not being able to complete speaking assignments there because of a hotel employee's strike which may make banquetting impossible.

25th A wire received en route caused a change in the original plans and we were met at Deer Lodge about 40 miles west of Butte by O. J. Guanell and motored to Anaconda where the final session and banquet of the Montana Pharmaceutical Association had been arranged. A fine turn-out of pharmacists and their ladies who listened attentively to the message from A. PH. A.'s Washington headquarters. By motor to Butte, arriving at Hotel Finlen while the strike was still in progress but the Women's Auxiliary of the Montana Association had kindly put the bedroom in order and there was no difficulty in getting a good night's sleep and seeing something of the city in this copper country on Sunday morning.

26th Now departing for Spokane and glad to have the company of Fred Felter, who was on his way back to Portland. A late evening arrival at Spokane meeting Ron Robertson, H. E. Henderson and other officers and members of the Washington State Pharmaceutical Association at the Davenport Hotel. Also a visit to the prescription shop conducted by Ron Robertson which is a professional pharmacist's dream of what can be done.

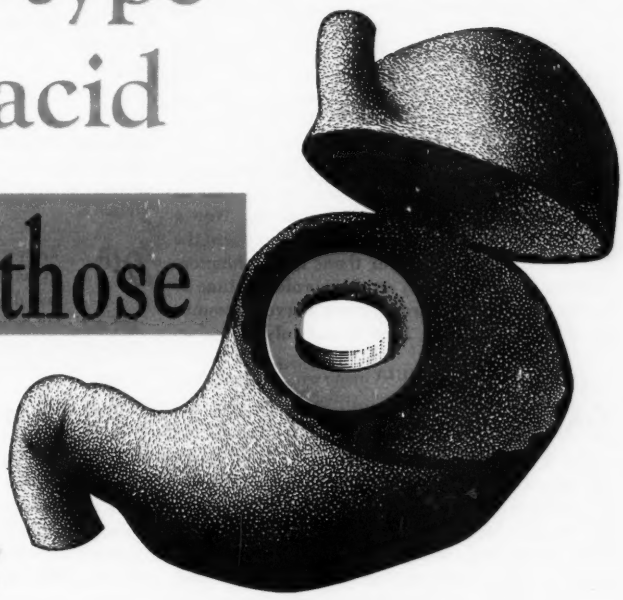
27th In the morning a trip around Spokane with Mr. and Mrs. Robertson and then to the meeting hall at the Davenport. It was a pleasure to see Deans Goodrich and Dirstine, Professor Rising and many others whose names make Washington State pharmaceutical news. An unexpected call to pinch-hit for Idaho's lieutenant-governor Donald Whitehead, who had been unavoidably prevented from filling the role of guest speaker at the luncheon and later addressing the convention after Bert Mull and Charles Lanwermeyer, both of whom made the circuit of Western State pharmaceutical association meetings during these pleasant June days. In the evening enjoying

(*Continued on Page 564*)

New type antacid

Carmethose

for better management of peptic ulcer



Carmethose gives prolonged control with no adverse effects

Carmethose promptly lowers gastric acidity, and its protective tenacious coating has been observed in the stomach for as long as three hours.[1]

Adult dose is 2 to 4 tablets or teaspoonfuls 4 times daily between meals.

Carmethose Tablets: *sodium carboxymethylcellulose, 225 mg. and magnesium oxide, 75 mg. Bottles of 100*

Carmethose Liquid: *5% concentration of sodium carboxymethylcellulose. Bottles of 12 oz.*

Advantages over adsorbent gels:

1. *Non-constipating*—hydrophilic gel promotes normal elimination.[1, 2]
2. *Reduction of acidity in two ways*—prompt action by ion exchange is followed by classical buffering action.
3. *Palatable*—small, easily swallowed tablets and pleasantly flavored liquid—preferred by patients.[2]

Advantages over soluble alkalis:

1. *No acid rebound*—effectively inhibits acid-pepsin activity, with no secondary hypersecretion.
2. *Protective coating*—mucin-like gel is rapidly formed and clings to ulcer crater and gastric mucosa.
3. *Non-systemic*—cannot disturb acid-base balance because it is non-absorbable.

1. Brick, I.B.: Amer. J. Dig. Dis., *In Press* 2. Bralow, Spellberg & Necheles: Scientific Exhibit #1112, A.M.A. Annual Session 1949

Ciba

PHARMACEUTICAL PRODUCTS, INC., SUMMIT, NEW JERSEY

CARMETHOSE—Trade Mark 2/1504

TYPICAL DAYS

(Continued from Page 562)

the annual banquet at which E. P. Ryan kept the audience laughing with his dissertation on "The Human Side of Politics." Among the pleasant interludes a visit with pharmacist W. E. Nelson of Sequim, who is a one-man chamber of commerce for his town and, in addition to lauding its pharmaceutical importance, extolls the virtues of its famous bacon and it is really worth talking about. Now a quick trip to the Great Northern depot to board the flyer for Chicago and from there to Washington, reaching the Capitol City on the morning of June 30 in time to join the Pharmaceutical Survey Committee at its final meeting, June 30 and July 1.

JULY

5th Work resumed at the office following the long Fourth-of-July weekend much of which was spent by this writer in reviewing the piles of correspondence, publications, releases, and other material which had accumulated during the western trip. Also a visit to Mike Korakas, our gardener, who was laid up at Georgetown University Hospital following an abdominal operation. The heat and humidity of Washington were most unpleasant after the cooling effects of the north pacific climate.

7th Today the Steering Committee of the Committee on Status of Pharmacists in Government Service met to review Army and Navy pharmaceutical affairs with Chairman Einbeck and George Frates and representatives of the military services in attendance. Also reviewing building expansion plans with the architects and planning the hospital pharmacy institute by telephone with Dr. Dolezal of the American Hospital Association in Chicago and Herbert Flack in Philadelphia.

9th These hot and humid days endeavoring to work out ways and means of cooling and drying the air in a building not equipped with air conditioning. Saddened by word from Philadelphia that Ambrose Hunsberger died yesterday.

14th Yesterday afternoon to Baltimore discussing financial problems and plans with H. A. B. Dunning, member of the A. PH. A. Council Finance Committee, and then to Philadelphia to participate in the final dinner session of the Seminar at the Philadelphia College of Pharmacy and Science. Today in New York conferring with Fred Lascoff and M. F. Arkus, who handles public relations for the American Heart Association. Now to the Chemists Club for dinner with Treasurer Schaefer and Finance Committee Chairman Swain

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Deceased Members

Berk, Samuel, Brooklyn, N. Y.
Carroll, Laura M., Aberdeen, S. Dak.
Crawford, Dean B., Atlantic City, N. J., Aug. 12, 1949
Eby, John S., Newport, Pa.
Englehardt, Ralph W., Rochester, N. Y., July 6, 1949
Hunsberger, Ambrose (a life member), Philadelphia, Pa., July 8, 1949
Keller, Browning E., Santa Monica, Calif., Nov. 24, 1948
Kimmel, Margaret, Valdosta, Ga., Aug. 5, 1949
Schmidt, Henry (a life member), Elizabeth, N. J., Aug. 6, 1949
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THE AMMONIATED MERCURY SALICYLIC ACID INCOMPATIBILITY

By C. LEE HUYCK*

THIS paper endeavors to correlate the chemical aspects with the therapeutic and practical aspects of an incompatibility of importance to both pharmacist and physician.

Ammoniated mercury is one of the most frequently used substances in psoriasis because it does not stain the skin or clothing. Because the action is weaker than chrysarobin, tar and pyrogallol, attempts have been made to increase its effectiveness by combining it with other drugs. Salicylic acid has been used with ammoniated mercury to promote the absorption of the mercury salt.

Severe Skin Irritations

Sulzberger[1] stated it is impossible to estimate the number of patients who have suffered severe skin irritations from the combined use of ammoniated mercury and salicylic acid. It is well known that combinations of these two drugs produced a synergistic effect as far as skin irritations were concerned. Fifty per cent of all persons tested reacted in some degree to an ointment containing 5% of salicylic acid and 5% ammoniated mercury. The following questions arise: Is the irritation due to the keratolytic effect of salicylic acid followed by a greater than ordinary absorption of ammoniated mercury, is the irritation due to the acidifying action of the salicylic acid, or is the irritation caused by compounds formed by chemical reaction of the two ingredients?

Siemens and Schreiber[2] found that patients who could tolerate 10% salicylic acid ointment and 10% ammoniated mercury ointment separately reacted severely when the combination of the two ointments was applied. These workers found that when two molecules of salicylic acid are mixed with one molecule of ammoniated mercury the two chemicals reacted to form corrosive sublimate, mercuric salicylate, and ammonium salicylate according to the following equation:

$$4HC_7H_5O_3 + 2HgNH_2Cl = HgCl_2 + Hg(C_7H_5O_3)_2 + 2NH_4C_7H_5O_3$$

This reaction shows that equal weights of the two reactants resulted in enough salicylic acid to convert all the ammoniated mercury to chloride and salicylate.

Oil-in-water emulsion creams are more irritating than anhydrous bases. In water-containing ointment the transformation was incomplete in three months, while water-free ointments remained unchanged after several months of standing.

Studied Irritating Effect

Siemens and Schreiber[3] continued their studies on the irritating effect of mixtures of salicylic acid and ammoniated mercury in ointments. Of the products formed from the chemical reaction only mercuric chloride was found to have an irritating action on the skin. The irritation became evident when corrosive sublimate in petrolatum was applied to the skin in 1% concentrations. If salicylic acid was added to this ointment irritation increased. A combination of mercuric chloride and salicylic acid was more irritating than the mercuric chloride alone. This may be due to the keratolytic action of salicylic acid or to the products of double

* Director, Department of Pharmacy, Howard College, Birmingham, Ala. Presented before the Section on Practical Pharmacy, AMERICAN PHARMACEUTICAL ASSOCIATION, Jacksonville, Fla., April, 1949.

decomposition of the two chemicals as represented by the following equation:

$$HgCl_2 + 2HC_7H_5O_3 = Hg(C_7H_5O_3)_2 + 2HCl$$

This reaction shows that equal weights of the two reactants are just about enough of both chemicals to complete the reaction.

The combination of salicylic acid and ammoniated mercury was more irritating the greater the excess of unchanged salicylic acid after the reaction had taken place. An ointment with 5% salicylic acid and 10% ammoniated mercury was less irritating than an ointment with 10% salicylic acid and 5% ammoniated mercury.

The reaction of 5% salicylic acid and 10% ammoniated mercury in an ointment containing moisture may be expressed by the following equation:

$$HC_7H_5O_3 + HgNH_2Cl + HOH = Hg(OH)C_7H_5O_3 + NH_4Cl$$

This reaction shows that twice the amount of ammoniated mercury as salicylic acid forms basic mercuric salicylate and ammonium chloride. This accounts for the lessened irritation when the ointment was applied to the diseased skin.

The reaction of 10% salicylic acid and 5% ammoniated mercury in an ointment may be expressed by the following equation:

$$4HC_7H_5O_3 + HgNH_2Cl = Hg(C_7H_5O_3)_2 + NH_4Cl + 2HC_7H_5O_3$$

This reaction shows that twice the amount of salicylic acid as ammoniated mercury forms mercuric salicylate and salicylic acid. The mercuric salicylate is somewhat soluble in a solution of alkali halide. The excess salicylic acid and the mercury salicylate in solution account for the irritating action of the ointment on diseased skin.

The clinical report stated that the reaction took place much more rapidly on the skin than in the ointment jar. This is to be expected because the ointment is contaminated with moisture as soon as it is applied to the skin.

Summary

1. Siemens and Schreiber[2] have shown that equal weights of salicylic acid and ammoniated mercury in an ointment base produced mercuric chloride, mercuric salicylate, and ammonium salicylate which are irritating when applied to the skin.

2. Equal weights of mercuric chloride and salicylic acid produced mercuric salicylate and hydrochloric acid.

3. In the presence of moisture twice the amount of ammoniated mercury as salicylic acid forms basic mercuric salicylate and ammonium chloride.

4. Twice the amount of salicylic acid as ammoniated mercury forms mercuric salicylate and salicylic acid. Since mercury salicylate is somewhat soluble in a solution of alkali halide, and since salicylic acid is an active keratolytic, the irritation of this combination is accounted for.

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California to Require Four-Year Course of All Applicants

An amendment to the California Pharmacy Law, effective January 1, 1950, provides that after that date no application for examination can be accepted unless the applicant is a graduate of a four-year course in a recognized college of pharmacy. The October, 1949, examination will be the last examination at which applicants with less than four years of college may be accepted.

The present California requirements are as follows and will apply to the October examination: Persons studying pharmacy prior to 1927 must have completed a course of not less than two years; between 1927 and 1932, the course must have been not less than three years; and for those who studied pharmacy after 1932 the course must have been four years.

Applications may be filed with the Secretary, California State Board of Pharmacy, 507 Polk Street, Room 313, San Francisco, Calif. The examination will be held in Los Angeles on October 4, 5, and 6, and in San Francisco on October 18, 19, and 20.

Iodine Abstracts and Reviews

A new bimonthly periodical, *Iodine Abstracts and Reviews*, is being prepared by the Iodine Fellowship at Mellon Institute, Pittsburgh 13, Pa., to provide summaries of scientific and technical literature relating to the uses of iodine and its compounds in chemistry and in the industries. From time to time there will be presented reviews of specific phases of the science and technology of iodine.

Complimentary subscriptions to *Iodine Abstracts and Reviews* may be obtained by addressing the Iodine Educational Bureau, Inc., 120 Broadway, New York 5, N. Y.

ASSOCIATIONS

The annual installation dinner of the **Dutchess County (N. Y.) Pharmaceutical Association** was held on June 8 in Poughkeepsie and the following officers were installed for the coming year: Vincent Logolbo, president; Milton Luks, first vice-president; Arthur Levinsohn, second vice-president; Edward Martin, secretary; and Gustav Klein, treasurer. Speakers at dinner were: W. Rutherford James, general manager and sales director of Towns and James Pharmaceutical house; Frank Emma and Nicholas Gesoalde, president and secretary, respectively, of the **New York State Pharmaceutical Association.**

Members of the **Westchester County (N. Y.) Pharmaceutical Association** at its May meeting heard John Cooper of Schenectady discuss New York's new compensation, liability and health insurance law which becomes effective in 1950. A film, "Sell as the Customers Like It," also was shown at the May meeting. At a recent meeting of the Westchester group, Dr. A Holla, County Health Commissioner, outlined ways by which the pharmacist can help curb cancer. Col. Frank Smith, State narcotics commissioner, and J. J. O'Brien of Rochester, vice-president of the State Association, debated a proposed law which would require a doctor's prescription for sale of patent medicines containing any narcotic.

Thomas V. Kenny, Troy (N. Y.) attorney, spoke at the annual dinner party of the **Troy Area Pharmaceutical Association** on May 22 at the Van Schaick Island Country Club. Dean Francis E. O'Brien of Albany College of Pharmacy installed the newly elected officers.

Dr. J. R. Williams, Jr., discussed compulsory medical care at the May meeting of the **Rochester Pharmaceutical Association.** A film "Energy Release from Food," also was shown.

At the annual dinner meeting of the **Staten Island Pharmaceutical Association** in May, Frank A. Emma and Edgar Bellis were guest speakers.

District 6 of the **Mississippi State Pharmaceutical Association** held its annual spring meeting on May 29 in Meridian, Miss. Officers elected were: J. B. Tutor, chairman; Phyllis Caver, vice-chairman; and R. M. Hamill, secretary. All are from Meridian.

"Interpretation of Amendments—New York State Narcotic Laws" was the topic discussed by Col. Frank J. Smith, Chief of the State Narcotic Control Section, at the May meeting of the **Italian Pharmaceutical Association** in Buffalo.

MANUFACTURERS

Ciba Pharmaceutical Products, Inc., Summit, N. J., has announced the election of Norman F. Storm as executive vice-president of the company. Mr. Storm has been in charge of production for the firm for nearly 20 years and since March, 1943, has been vice-president in charge of production.

The new director, Division of Medical Sciences of **McNeil Laboratories,** is Dr. Charles F. Kade, Jr. In this capacity he will direct the research and development activities of the company.

The first pharmaceutical plant to be built in Argentina primarily for large-scale production of penicillin has been completed by **E. R. Squibb & Sons.** The $4,000,000 manufacturing project was built almost entirely with Argentine funds.

The *Overflow*, a monthly publication for **Upjohn** sales and branch office personnel, was a first prize winner in the 1949 International Industrial Publications contest. The contest is sponsored by the International Council of Industrial Editors, and the winners were announced during their annual convention at Toronto, Canada. A new Philadelphia Branch of **The Upjohn Co.** was opened early in July with Fernen E. Fox, who was transferred from the Minneapolis Branch, as sales manager.

James Hill, Jr., chairman of the board and president of **Sterling Drug, Inc.,** has been elected to the board of directors of **Brand Names Foundation.** Mr. Hill was named to fill the unexpired term of the late Edward S. Rogers, past chairman of the Board of Sterling Drug, who died recently. Brand Names Foundation is a nonprofit, educational institution supported by manufacturers, advertising media and advertising agencies.

A. Eugene DeWald of **Smith, Kline & French Laboratories,** Philadelphia, Pa., was recently awarded the Karr fellowship, which is given to a promising member of the scientific staff of the firm for further study and advancement in his respective field. Mr. DeWald will attend the University of Minnesota for a period of three years, studying for his doctorate in physical chemistry.

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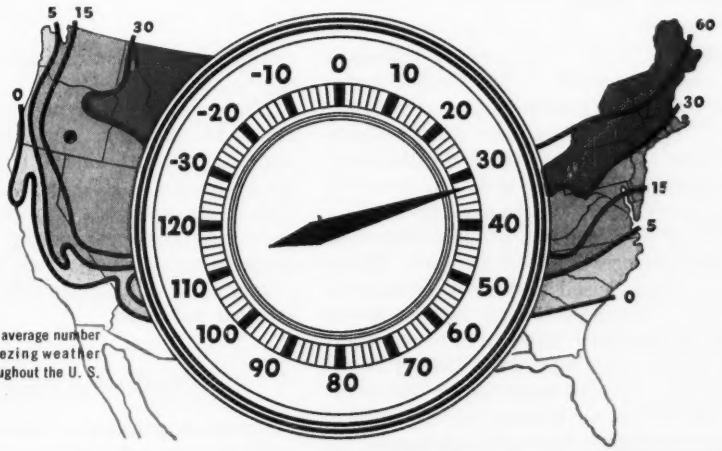

Map shows the average number of days of freezing weather each year throughout the U. S.

THE MANUFACTURE OF HYPODERMIC TABLETS*

by G. J. SPERANDIO and H. G. DeKAY

MEDICATION in the form of tablets is used extensively in the United States today, and the reasons for its popularity are many. Specific advantages which tablets offer over other forms of medication are: Ease of administration, stability, accuracy and concentration of dosage, portability, rapid solubility, economy, absence of alcohol, and convenience to the dispenser.[1] These features have caused the tablet industry to expand rapidly, and as early as 1914 it was estimated that from one-fourth to one-third of all the medicaments in the United States were administered in tablet form.[2] Although much has been written concerning tablets and their manufacture, very little specific information has been told, as the manufacturers are naturally reluctant to share their trade secrets. The need for research on tablet manufacture has been recognized and various investigations have been started.[3] This paper is a report on experiments on the preparation of hypodermic tablets.

Tablets are defined as "unit dosage forms of medication containing one or more medicinal agents with or without diluents, obtained by molding the mixture in the form of a fine powder, or compressing it in the form of a granular powder into a suitable shape."[4]

Tablets in general may be classified under two headings: Compressed tablets, which are made by mechanical compression of a prepared granulation, and molded tablets, which are made by molding a wet paste in suitable forms, ejecting the wet tablets, and drying them.

The majority of hypodermic tablets are made by molding, and the process has changed very little since it was introduced to the profession in 1878 by Dr. R. M. Fuller.[5] This method consists of mixing the medicament with milk sugar, adding alcohol and/or water to make a paste, and pressing it into molds. The tablets thus formed are then expelled and dried.

Slow Method of Manufacture

Present-day industry still uses this slow method of manufacture because of the rigid specifications for hypodermic tablets. Since they are put into solution for injection they must be completely soluble, must disintegrate almost immediately, and must form a perfectly clear solution. They must contain no excipients which would have either a chemical reaction with the medicinal ingredients or a physiological action on the patient. They must be small, yet sufficiently well formed to withstand handling and packaging. Wolff states that "since hand production is slow, the need for such tablets by mechanical production is obvious."[6]

If a granulation could be formulated which, when compressed on a tablet machine, would yield a tablet containing all of the above qualities, the field of hypodermic tablet manufacture would be greatly advanced. The purpose of this work was to investigate the possibilities of making hypodermic tablets by compression on a tablet machine.

* A contribution from the Research Laboratories, Purdue University, School of Pharmacy, Lafayette, Ind. Presented before the Section on Practical Pharmacy, AMERICAN PHARMACEUTICAL ASSOCIATION, San Francisco, Calif., August, 1948

Experimental

In order to have a definite standard of comparison, samples of seven different hypodermic tablets made by a commercial manufacturer were checked for weight, disintegration time, and clarity of solution. All of the tablets with the exception of one weighed between 0.5 and 0.6 grains and dissolved to form a clear solution. The average disintegration time was 37 seconds.

From the literature, the following substances were selected for use in making a granulation: Lactose, white dextrin, maltose, dextrose, *d*-galactose, mannitol, sorbitol, levulose, calcium levulinate, soluble starch, and aminoacetic acid. All of the materials with the exception of white dextrin, soluble starch, and calcium levulinate were found to dissolve satisfactorily to give a clear solution. The materials deemed satisfactory were granulated with both water and alcohol, and the granulations were examined for their physical properties and their compressibility on a single punch tablet machine. Combinations of these substances in varying proportions were also granulated and tested. Upon compression, all granulations showed a tendency to bind and cap; none made a firm tablet.

It was decided to add an adhesive agent to the granulations to facilitate compression and attain a harder tablet. Granulations of the above substances were made using the following adhesives in varying amounts: Sucrose, glucose, dextrose, gelatin, acacia, and sorbitol. The granulations were made in two ways. First the adhesive was added to the substance in a dry form and the mixture was granulated with water. Next the adhesive was dissolved in water and the powders were granulated with the solution. It was concluded that adhesive substances are more effective when added to the granulation in solution than when mixed in as dry powder. It was also determined that a 2% aqueous solution of glucose seemed to make the best granulation with aminoacetic acid, and that this aminoacetic acid granulation offered definite possibilities for compression—much more so than any of the other substances.

A trial batch of tablets of strychnine sulfate of $^1/_{30}$ grain was formulated with aminoacetic acid as the base and a 2% solution of glucose as the granulating agent. Compression was attempted on a Stokes' rotary tablet machine using a $^3/_{16}$-inch die. Results were good but not entirely satisfactory as it was noticed that there was a slight tendency toward sticking upon continued running of the machine. A limited number of lubricants were tried using aminoacetic acid granulation as the trial granulation. Powdered boric acid, citric acid, tartaric acid, sodium stearate, and sodium chloride were added to the granulation in varying proportions. Powdered boric acid in the amount of 12% was the only substance to offer satisfactory lubrication to the granulation.

Six different batches of hypodermic tablets were made, primarily for the purpose of determining whether the aminoacetic acid base and the boric acid lubricant would compress satisfactorily with different amounts and different kinds of medicinal agents. The results are shown in the table below.

Four of the six granulations made compressed satisfactorily in every respect and the other two compressed fairly well, but evidenced slight sticking which was overcome by minor adjustments of the machine. All of the resulting tablets were excellent in appearance and formed a clear solution when dissolved in water. All but one had a disintegration time under 35 seconds.

It should be emphasized that the preceding work has been primarily of an experimental nature to determine the feasibility of making hypodermic tablets by compression and that several aspects of this method must be further investigated before the manufacture on a commercial basis can be advocated. The question of sterility must be settled, since hypodermic tablets should be

Results of Experiments on Six Drugs

Tablet	Ease of Compression	Hardness	Average Weight, in Grams	Disintegration	Solution
Strychnine SO_4 $^1/_{30}$ gr.	Good	Good	0.060	35 sec.	Clear
Atropine SO_4 $^1/_{120}$ gr.	Good	Good	0.067	20 sec.	Clear
Scopolamine HBr $^1/_{120}$ gr.	Good	Good	0.057	15 sec.	Clear
Ephed. SO_4 $^3/_8$ gr.	Fair	Good	0.066	15 sec.	Clear
Morphine SO_4 $^1/_6$ gr.	Good	Good	0.053	15 sec.	Clear
Na Phenobarb. $^1/_4$ gr.	Fair	Good	0.061	65 sec.	Clear

sterile when received by the physician. A conveyor belt system might be set up in which the granulation would be sterilized during drying and then led into a special room containing the tablet machine, the room to be kept aseptic by lamps suitable for that purpose. Packaging of the tablets could be done in the same manner now in use.

The question of the toxicity of boric acid was considered since some authorities might question its use in tablets intended for injection. According to Sollman,[7] quantities to 0.5 Gm. have no immediate reaction in normal individuals. Since each tablet would contain not more than 0.007 Gm. of boric acid, the amount might be small enough to be considered negligible; but again, this would have to be further investigated.

The use of aminoacetic acid as a base has two possible disadvantages: First, it is considerably more expensive than the bases used for molded tablets and might make the cost of compressed hypodermic tablets prohibitive. Second, it is not compatible with all types of medication although it can be used with most substances commonly found in hypodermic tablets. Aminoacetic acid itself forms neutral or slightly acid solutions and would be incompatible with strongly alkaline compounds.

However, our experiments indicate that compression of a completely soluble tablet is possible. The reported combination is the first which we have found. Quite possibly other combinations of soluble bases and lubricants may be formulated which will result in a hypodermic tablet satisfying all the requirements. Experiments are being continued toward this end.

Conclusions

The following conclusions may be drawn from the work completed thus far:

1. Most water-soluble substances suitable for bases for hypodermic tablets do not possess enough cohesiveness to be used alone as bases.
2. An adhesive substance is more effective when added to the granulation in solution as the granulating agent than when mixed with the dry powders and granulated with water.
3. Aminoacetic acid seems to be a satisfactory base for most hypodermic tablets.
4. A 2% solution of glucose is the granulating agent of choice.
5. Powdered boric acid in high percentages is a satisfactory lubricating agent for aminoacetic acid granulations containing various medications.
6. Hypodermic tablets can be manufactured by compression on a tablet machine.

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Guidebook for Manufacturers

"Developing and Selling New Products—A Guidebook for Manufacturers," by Gustav E. Larson, Marketing Division, U. S. Department of Commerce, is now available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 25¢. Purpose of this booklet is to provide information which will aid business firms in answering such frequently asked questions as:

1. How and where may ideas for new products be found?
2. How may a company improve its chances of selecting a successful new product?
3. How may a new product suitable to customer needs and desires be built?
4. How should name, package, and trade-mark be chosen?
5. What points should be considered in planning a marketing program for a new product?

For purposes of this booklet, a broad definition of the term "new product" has been adopted. The definition used includes: (1) products entirely new and not previously manufactured; (2) products new to a manufacturer or industry; and (3) redesigned products. Both consumer and industrial products are discussed.

A public lecture series sponsored by the **Chicago Technical Societies Council,** which includes 60 scientific, engineering, and technical societies in the Chicago area, included a talk on "New Drugs and Their Uses" by Dr. F. Maher of the University of Illinois.

NEW FACULTY ASSIGNMENTS

(*Continued from Page 545*)

University of Texas

Three new professors have joined the University of Texas College of Pharmacy faculty. Dr. William Reese Lloyd becomes an associate professor while Melvin A. Chambers and Dr. Robert F. Doerge have been appointed assistant professors.

Howard College

Josephine Siragusa has been appointed instructor in pharmaceutical chemistry and Owen Crutcher has been named instructor in pharmacy at Howard College, Birmingham, Ala.

University of Houston

Dr. N. M. Ferguson has been named the first full-time director of the University of Houston School of Pharmacy. Dr. Ferguson, who has been in teaching for 19 years, was professor of chemistry at Ashland College, Ohio.

Philadelphia College of Pharmacy and Science

New members of the faculty of the Philadelphia College of Pharmacy and Science who assumed their teaching duties this Fall are: Dr. Nathan A. Hall, who came from the College of Pharmacy of the University of Washington, Seattle; Dr. Roger E. Fox of Philadelphia, who became a member of the teaching staff in pharmacology; David Krigstein, Nina Sideri, Bernard B. Barshay and William H. Zubyk. Grafton D. Chase rejoined the chemistry staff and Dr. Eric Martin has inaugurated a course in biochemistry.

THE PUBLIC'S HEALTH

(*Continued from Page 560*)

lessness or dyspnea may be due to anemia or pulmonary diseases; precordial pain on exertion may be caused by muscle strain, pleuritis, intercostal neuralgia, or lesions of abdominal viscera; and swelling of the legs or edema may occur from liver and kidney diseases. It is obvious that some complaints, such as insomnia, faintness, and others, are more frequently due to other causes. It is nonetheless clear that if any of the symptoms mentioned is persistent, the individual needs medical attention whatever the underlying cause. By directing persons with such manifestations to see a physician, pharmacists can greatly assist in uncovering heart cases—thus contributing to the lengthening and the saving of lives.

1950 IODINE RESEARCH AWARD NOMINATIONS REQUESTED

Nominations are now being received by the AMERICAN PHARMACEUTICAL ASSOCIATION for the 1950 Iodine Educational Bureau Award recognizing outstanding research in the chemistry and pharmacy of iodine and its compounds as applied in pharmacy or medicine. Any member of the ASSOCIATION may propose a nominee by submitting eight copies of each of the publications to be considered in the competition, a biographical sketch of the nominee including date of birth, and a list of his publications. Eight copies of the nomination must be submitted to Robert P. Fischelis, Secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION, 2215 Constitution Ave., N. W., Washington 7, D. C. To be eligible for the 1950 Award, nominations must be received on or before January 1, 1950.

A nominee must be a resident of United States or Canada. He must have accomplished outstanding research in the chemistry or pharmacy of iodine and its compounds as applied in pharmacy or medicine.

During the period covered by the nomination the nominee shall have been actively engaged in, shall have completed, or shall have published a report upon the line of investigation for which the award is made. During a period of two years prior to the date of nomination, the nominee shall not have been engaged in research under the sponsorship of the Iodine Educational Bureau, Inc.

The award consists of $1000 and a diploma setting forth the reasons for selection of the recipient. It may be presented annually at the annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION.

The recipient will deliver a paper or lecture upon the subject of his scientific work at the meeting at which the award is conferred. His paper, or address, will then be published in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION. In addition to the sum of the award, the recipient will receive an allowance of not more than $250 to defray his expenses in attending the meeting.

The recipient will be selected by an award committee which is appointed by the chairman of the ASSOCIATION'S Council and which functions under prescribed rules. The present committee includes Justin L. Powers, chairman; Louis Gershenfeld, Charles O. Wilson, Harvey B. Haag, Heber W. Youngken, John C. Krantz, and Frank O. Taylor.

The award is now in its third year. The recipient of the first award was Dr. William T. Salter, Yale University pharmacologist. Dr. George M. Curtis, Chairman of the Department of Surgical Research and Professor of Surgery at Ohio State University, will be the recipient of the second award and will give the 1950 Iodine Award lecture.

A. Ph. A.'s Second Vice-President

Leib L. Riggs

LEIB L. RIGGS, practicing pharmacist and second vice-president of the AMERICAN PHARMACEUTICAL ASSOCIATION, was born February 7, 1900, in Dallas, Oreg. He received Ph.G. and B.Sc. degrees from Oregon State College in 1922. He has owned and managed his own pharmacies since 1926 and now owns two prescription pharmacies in Portland, Oreg. He is past president of the Oregon State Pharmaceutical Association and Portland Retail Druggists Association. He joined the AMERICAN PHARMACEUTICAL ASSOCIATION in 1939 and has been a member of the House of Delegates during the past three conventions. He is now serving his third year as a member of the Oregon State Board of Pharmacy, and has served on numerous state and local legislative and pharmaceutical advisory committees. Mr. Riggs has been active in civic and fraternal affairs in Portland. He is a Mason and Shriner, past president of Kiwanis and Agenda clubs and a member of Delta Sigma Rho and Chi Phi fraternities.

PERCENTAGE STRENGTH PENICILLIN

(Continued from Page 551)

More solution is made than is required to fill the prescription, but this cannot be avoided except by suggesting to the physician the dispensing of 12 cc. instead of 15 cc., thereby making it possible to use a vial containing 100,000 units and avoiding waste of the excess solution obtained with the vial of 200,000 units.

The following table will serve to supply information commonly required for making percentage penicillin ophthalmic solutions:

Penicillin Percentage, Unitage and Weight[a]

Per Cent	Total Units	Units per Cc.	Total Weight in Mg.
0.03	7,500	500	4.5
0.06	15,000	1,000	9.0
0.10	25,000	1,666.6	15.0
0.50	125,000	8,333	75.0
1.00	250,000	16,666	150.0

[a] Expressed in milligrams contained in 15 cc. of solution.

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Soltabs penicillin are widely used in pediatrics for oral administration of penicillin dissolved in the milk formula or in water. Also applicable in aerosol inhalation therapy where they greatly simplify dosage calculation and preparation of solutions for administration.

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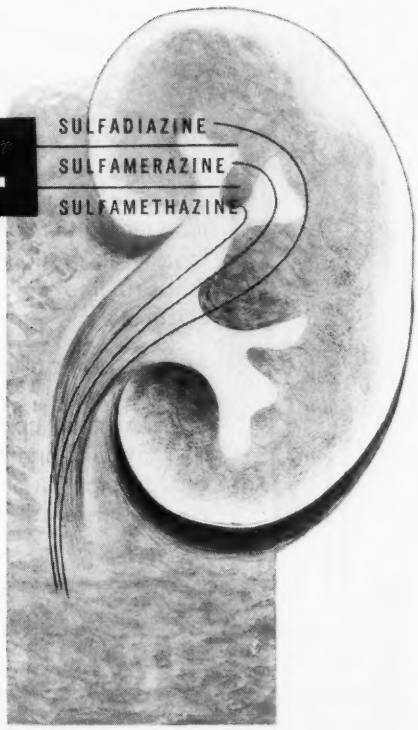

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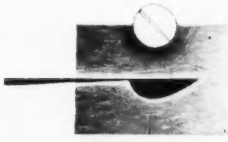

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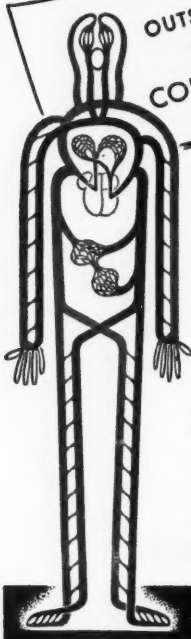

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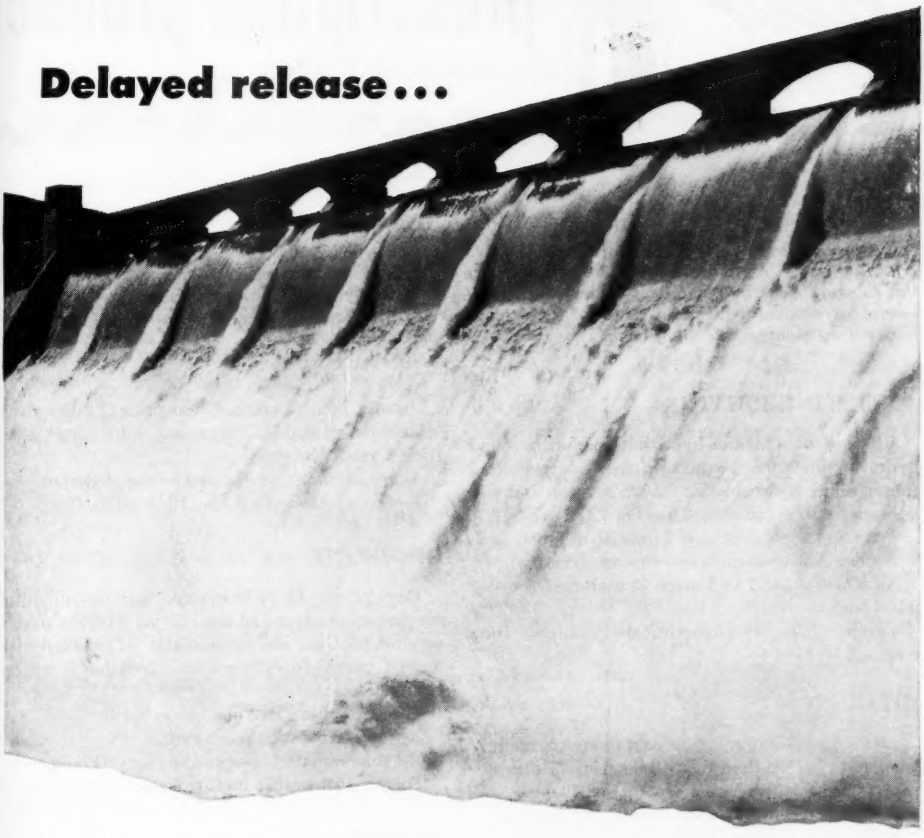

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New prescription products

Product descriptions may be clipped and filed on three- by five-inch cards. These are also indexed for quick reference in the "Monthly Drug Index" appearing on the last page of each issue. A product is described in this column for the information of pharmacists who may be asked by physicians to stock the drug, or who may receive professional inquiries about it. A listing does not imply evaluation or recommendation by the Association, nor does omission of any product have significance concerning its merit.

ANTISTINE-PRIVINE

Description: Antistine hydrochloride (phenazoline hydrochloride) 0.5% and Privine hydrochloride (naphazoline hydrochloride) 0.025% in an isotonic aqueous solution buffered at a *p*H of 6.1.

Form Supplied: Bottles of 1 oz. with dropper.

Action: Antihistaminic and vasoconstrictor.

Administration: 2 to 3 drops in each nostril every 3 to 4 hours.

Source: Ciba Pharmaceutical Products, Inc., Summit, N. J.

BILOGEN

Description: Tablets each containing ox bile extract 120 mg., oxidized mixed bile acids 75 mg., desoxycholic acid 30 mg., and pancreatin 250 mg.

Form Supplied: Bottles of 100 and 1000 tablets.

Action: Choleretic and digestant.

Administration: 1 or 2 tablets after meals and at bedtime.

Source: Organon Inc., Orange, N. J.

CICOLINE

Description: Syrup containing 1.25 Gm. choline dihydrogen citrate in each 5 cc.

Form Supplied: Pint and gallon bottles.

Action: Reverses fatty infiltration of the liver and prevents further hepatic cell destruction.

Administration: Orally; dosage dependent upon degree of liver involvement.

Source: Barlow-Maney Laboratories, Inc., Cedar Rapids, Iowa.

DIFFUSIN

Description: Lyophilized hyaluronidase, a naturally occurring enzyme which hydrolyzes hyalin or cell-cementing substance.

Form Supplied: Packages of 3 vials, each vial containing 150 T.R.U. (turbidity reducing units) of sterile, lyophilized hyaluronidase.

Action: Increases rate of absorption of fluids given subcutaneously, including saline, saline in glucose, Ringer's solution, etc.

Administration: As directed by the physician.

Source: G. D. Searle & Co., Chicago 80, Ill.

DRODEINE

Description: Each fluidounce contains dihydrocodeinone bitartrate 10 mg., terpin hydrate microcrystals 1.5 Gm., and an aromatic. Preserved with methyl parahydroxybenzoate. Drodeine is an exempt narcotic.

Form Supplied: Pint and gallon bottles.

Action: Sedative; expectorant.

Administration: 1 teaspoonful every 3 hours.

Source: Pitman-Moore Co., Indianapolis 6, Ind.

FEROMA

Description: Capsules each containing ferrous sulfate exsiccated 0.2 Gm. and glutamic acid hydrochloride 0.3 Gm.

Form Supplied: Bottles of 100 and 1000 capsules.

Action: Secondary anemia therapy. The glutamic acid hydrochloride is intended to promote the absorption and assimilation of iron by stimulating the production of acid in the stomach.

Administration: 1 capsule 3 times daily.

Source: Sharp and Dohme, Inc., Philadelphia 1, Pa.

METHAJADE

Description: Each 30 cc. contains methadone hydrochloride 10 mg.; phenylpropanolamine hydrochloride, 0.12 Gm.; potassium citrate; diluted phosphoric acid; and alcohol 5%. Methajade is an exempt narcotic.

Form Supplied: Pint and gallon bottles.

Action: Sedative; expectorant.

(*Continued on Page 584*)

physicians are specifying

PENICILLIN S-R
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PENICILLIN S-R means Soluble and Repository penicillin combined to give the special advantages of both.

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PENICILLIN S-R means Speedy Rise of blood penicillin levels.

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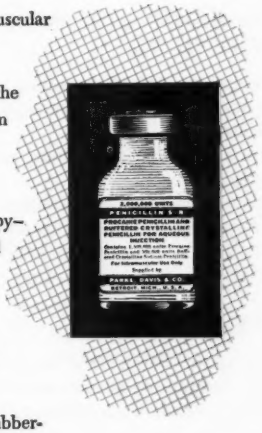

PENICILLIN S-R means Simplified Routine in penicillin therapy—easily prepared, quickly injected, no clogged needles or syringes.

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PENICILLIN S-R is supplied in one-dose (400,000 units), five-dose (2,000,000) and ten-dose (4,000,000) rubber-diaphragm-capped vials. When diluted according to directions, each cc. contains 300,000 units of crystalline procaine penicillin-G and 100,000 units of buffered crystalline sodium penicillin-G. The one-dose vial is also available if desired with an accompanying ampoule of Water for Injection, U.S.P.

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NEW PRESCRIPTION PRODUCTS

(Continued from Page 582)

Administration: 1 to 2 teaspoonfuls every 3 or 4 hours.

Source: Sharp & Dohme, Inc., Philadelphia 1, Pa.

PARADIONE

Description: Capsules containing 0.3 Gm. and solution containing 0.3 Gm. per cc. of paramethadione, a homolog of trimethadione (Tridione) differing only in the substitution of an ethyl for a methyl group on carbon 5.

Form Supplied: Capsules in bottles of 100 and 1000; solution in 50-cc. bottles with graduated dropper.

Action: Treatment of petit mal, myoclonic, and akinetic epilepsy. Photophobia, the most frequent reaction to Tridione, is infrequent with Paradione. Contraindicated in patients with severe renal or hepatic disorders.

Administration: As determined by the physician according to the response and to the control of side reactions.

Source: Abbott Laboratories, North Chicago, Ill.

pHISODERM with HEXACHLOROPHENE 3%

Description: 3% of hexachlorophene [bis(2-hydroxy-3,5,6-trichlorophenyl)methane] incorporated in pHisoderm.

Form Supplied: Pints, gallons, and 3-oz. refillable hand dispensers.

Action: Anti-infective; detergent.

Administration: Topically; preoperative scrub.

Source: Winthrop-Stearns Inc., 170 Varick St., New York 13, N. Y.

SUB-Q-PAK

Description: Disposable hyperdermoclysis unit for the subcutaneous administration of fluids.

Form Supplied: Each unit consists of a dispensing cap, air filter, Murphy drip, plastic tubing, with "y" assembly, two pinch clamps, and needle adapters with protective covering. Packed sterile and preassembled. Boxes of 20 units.

Source: Abbott Laboratories, North Chicago, Ill.

SULFAMYLON HYDROCHLORIDE

Description: 1% buffered aqueous solution of 4-aminomethylbenzene sulfonamide hydrochloride. with aromatics.

Form Supplied: Bottles of 1 and 8 fl. oz.

Action: Treatment of upper respiratory infections.

Administration: Instillation, irrigation, atomizer spray, or wet dressings.

Source: Winthrop-Stearns Inc., 170 Varick St., New York, 13, N. Y.

SULFAMYLON with STREPTOMYCIN

Description: 5% solution of Sulfamylon hydrochloride (4-aminomethylbenzene sulfonamide hydrochloride) and Streptomycin sulfate 20 mg.

Form Supplied: Combination package of Sulfamylon hydrochloride 5% solution, 100 cc., and Streptomycin sulfate 20 mg.

Action: Treatment of wound infections.

Administration: Topically.

Source: Winthrop-Stearns Inc., 170 Varick St., New York 13, N. Y.

THERAGRAN

The new trade-marked name Theragran has been adopted by E. R. Squibb and Sons for the multiple vitamin preparation formerly known as Therapeutic Formula Vitamin Capsules.

TRICOMBISUL

Description: Tablets containing 166 mg. each of sulfacetamide, sulfadiazine, and sulfamerazine.

Form Supplied: Bottles containing 100 and 1000 tablets.

Action: Treatment of infections amenable to sulfonamides.

Administration: As determined by the physician.

Source: Schering Corp., Bloomfield, N. J.

VIR-I-TOL

Description: Tablets containing mannitol hexanitrate 30 mg., phenobarbital 15 mg., rutin 20 mg., veratrum viride 100 mg.

Form Supplied: Bottles of 100 and 1000 tablets.

Action: Treatment of hypertension.

Administration: 3 to 6 tablets a day, depending upon the patient's response.

Source: Barlow-Maney Laboratories, Inc., Cedar Rapids, Iowa.

Apparatus and Equipment

Ames Selftester

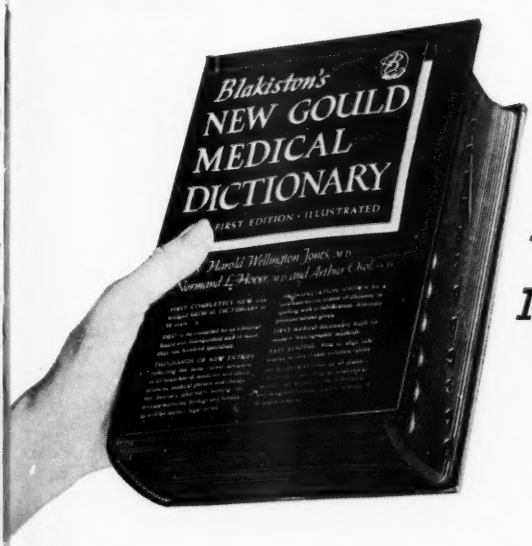
A kit for detection of sugar in urine as a home test performed by the public. Consists of two reagent tablets, one dropper, one test tube and directions for use in each kit. *Manufacturer:* Ames Co., Elkhart, Ind.

Spencer Microscopes

A new series of microscopes incorporating many new features for use by industrial laboratory and research workers, physicians, students and others needing a precision microscope. *Manufacturer:* American Optical Co., Scientific Instrument Division, Buffalo, N. Y.

AS BASIC A TOOL AS THE PESTLE AND MORTAR

Every Druggist should have Blakiston's New Gould Medical Dictionary



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Greater Safety

in Dual Sulfonamide Therapy

With Aldiazol-M, adequate sulfonamide dosage may be administered with utmost therapeutic advantage and with minimal danger of crystalluria. Providing both sulfadiazine and sulfamerazine in equal amounts, it permits greater total urinary sulfonamide saturation. Thus the risk of crystal precipitation is reduced, even when large amounts are given.

Because its sulfonamides are in microcrystalline form, Aldiazol-M leads to rapidly attained initial levels. Thereafter therapeutic blood levels are maintained on a dosage of 2 teaspoonfuls every four hours (1 Gm. of total sulfonamide). The presence of sodium citrate in Aldiazol-M makes unnecessary the administration of other alkalizing agents.

Aldiazol-M is indicated in many infectious diseases which respond to sulfadiazine and sulfamerazine. Pleasantly flavored, it is especially useful in pediatric practice.

Each teaspoonful (5 cc.) of Aldiazol-M provides:

Sulfadiazine (microcrystalline)	0.25 Gm.
Sulfamerazine (microcrystalline)	0.25 Gm.
Sodium Citrate	1.0 Gm.

THE S. E. MASSENGILL COMPANY
Bristol, Tenn.-Va.
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ALDIAZOL-M

The road to relief of nasal congestion is paved with profits...

This month alone . . . 3 out of 4 families in your trading area will be seeking relief from acute or chronic rhinitis or sinusitis. Four opportunities for clinching this profitable business are offered in

The NEW WYAMINE® *Line*

● *THE NEW, NONSTIMULATING VASOCONSTRICTOR*

Wyamine, either as the volatile liquid, or the water-soluble sulfate, is an effective new vasoconstrictor, possessing several important advantages. Wyamine produces a local vasoconstriction approximately equal to that of ephedrine, but its action is seldom attended by returgescence, or by nervousness, excitability or insomnia.

Wyamine possesses virtually no stimulating properties in recommended dosage.

Available in these forms of issue

WYAMINE INHALER

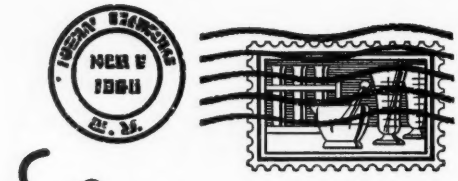
WYAMINE-PENICILLIN CAPSULES
(PENICILLIN WITH VASOCONSTRICTOR)
For Preparation of Nasal Solution.

SOLUTION WYAMINE SULFATE

SOLUTION WYAMINE-TYROTHRICIN

These solutions may be used either with dropper or Jetomizer™.

ORDER NOW Wyeth® WYETH INCORPORATED, PHILADELPHIA 3, PA.



Letters:

Lauds Promotion Materials

Sirs:

It is really a pleasure to receive just such a listing of valuable material as you have sent me. I personally am at a loss in selecting the proper material because it is all so worth while However, a group of independent pharmacists, including myself, are running a series of spot announcements in conjunction with a five-minute news summary on Radio Station WROV (Roanoke, Va.). This program conveys to the public that our stores are owned and operated by pharmacists.

Roanoke, Va. ALDEN S. HANKLA

Appreciation

Sirs:

As a June Pharmacy Graduate, I wish to thank you and the senior members of "our" organization for the favor of granting me active membership for the balance of my associate membership period. The application for active membership is enclosed.

Des Moines, Iowa BASIL P. KETCHAM

We welcome Mr. Ketcham and other A. Ph. A. student branch members who have graduated and are now transferred to active membership.—THE EDITOR

Important to Practicing Pharmacist

Sirs:

I take this opportunity to express my satisfaction with THE JOURNAL, which I have been reading each month since 1946. In spite of the fact that much space is absorbed by matters of only local American interest, THE JOURNAL keeps me quite well informed about new drugs and preparations, as well as about the progress of science in general. This information is very important to the practicing pharmacist as it enables him to advise the physician professionally.

Haifa, Israel DR. H. LEHMANN

A "Must" for Student Members

Sirs:

Enclosed you will find a money order for the necessary amount for an active membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

Since I was a member of the Student Branch of the A. PH. A. at the University of Wisconsin, I know it is a "must" to obtain an active membership in the organization. Now that I have completed my education and have become a registered pharmacist, I know this is necessary in order to keep abreast with all the advances continually being made in pharmacy.

Milwaukee, Wisc. DELL A. OLSZEWSKI

Praises Journals

Sirs:

As a new, and a foreign, subscriber to your JOURNAL, may I say how absorbingly interesting I have found those copies already received. Your domestic problems appear to be not unsimilar to those experienced here in Britain. The standard of papers published in the *Scientfic Edition* is very high. I feel a detailed study of your JOURNALS will result in a positive gain to me.

Cambridge, England A. S. THOM

Pharmacy in Israel

Sirs:

You might be interested to know that pharmaceutical life is steadily reorganized by the authorities, imposing better control on drug mercantilism and elevating the professional standards to a high standing. May I add that graduate pharmacists in the Israel Army Medical Service are granted commissions as second lieutenants with additional duty allowance. The pharmaceutical units in the army are steadily developing with the receipt of better tools, instruments and drugs, contributed to a great extent by the (United) States. I am sure that pharmacy as such will take its share in the present rehabilitation of the country.

Let me extend again my best wishes to the ASSOCIATION and trusting to enjoy even from afar its activities for the profession, I beg to be

Tel-Aviv, Israel EFRAIM MENCZEL

Record of Achievement

Sirs:

Please add our name to the long list of pharmacists participating in the distribution of information concerning public health. I am sorry to be so tardy in my application for this service. We do, however, distribute pamphlets from our own State Board of Health.

I would like to congratulate the ASSOCIATION on its record of achievement, and particularly for spearheading so many projects for professional promotion in the last 10 years.

And from the Pharmaceutical Survey come benefits to the personnel of pharmacy and the public, which are so long overdue.

Hazel Park, Mich. JOHN VIS

THE MOST ATTENTION-COMPELLING PRESCRIPTION BALANCE EVER

Designed by
Raymond Loewy Associates

Here, at last, is a subtle yet effective way to 'display' the pharmacist's skill...that skill your customers must trust, but can sense only indirectly.

You'll find the Rx-1 is *new confidence insurance,* ready-made for an 'open' department. Who among your customers could fail to notice such equipment...and be impressed?

But more than that, you'll discover that the Rx-1 is something you can proudly point out to every visiting physician.

You can help set the stage for increased prescription business at satisfactory prescription prices, with the Rx-1.

The New
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Prescription Model Rx-1...
sensitivity 1/32 grain
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Your Drug Supply Salesman carries a picture-portfolio, with complete specifications of the Rx-1.

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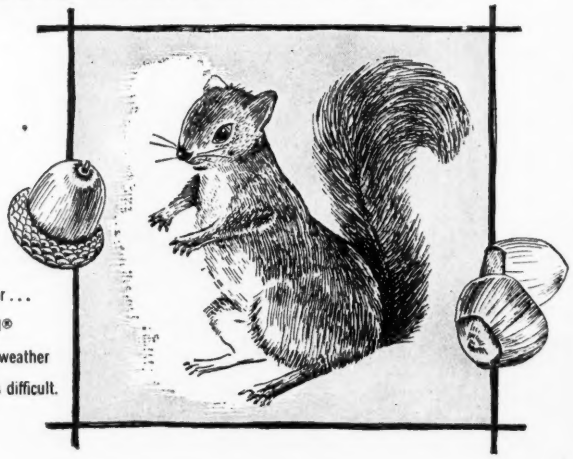
stock up on

CREAMALIN *now!*



Beat old man winter . . .
Stock up on CREAMALIN®
now, before freezing weather
makes liquid shipments difficult.

CREAMALIN, the first brand of
aluminum hydroxide, will be consistently
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Don't be caught out of stock and out of luck
on reordering. Anticipate your needs
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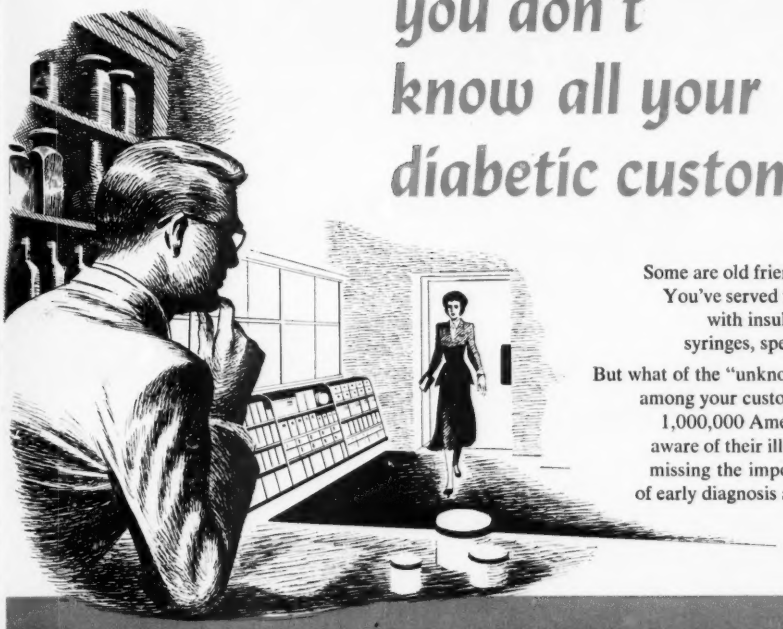
CREAMALIN, trademark reg. U. S. & Canada

you don't know all your diabetic customers!



Some are old friends, of course. You've served them for years with insulin, *Clinitest*,® syringes, special foods . . .

But what of the "unknown diabetics" among your customers. At least 1,000,000 Americans are not aware of their illness. They are missing the important benefits of early diagnosis and treatment.

you can serve the "unknown diabetic" with a simple home test—

Selftester

(BRAND)

urine-sugar detector

Selftester (Brand) Urine-sugar Detector is approved by the Council of the American Diabetes Association. It is simple to perform—easy to interpret. It *does not* diagnose disease – it *does* detect sugar in the urine. Individuals with a positive reaction are instructed to see their doctor for diagnosis.

Each *Selftester* contains a test tube, medicine dropper, two *Clinitest* (Brand) Reagent Tablets, and clear concise instructions. It is an over-the-counter item distributed through regular drug channels. Order now from your wholesale druggist.

Selftester (2 tests per package)		
Retail Fair Trade Price	per doz. $4.68	ea. $.39
Your Cost	" " 2.80	" .23⅓
Your Profit	" " $1.88	" $.15⅔

An extra 10% discount is allowed on orders for Ames products of $50.00 or more at minimum wholesale fair trade price.

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Bacitracin . . . for every clinical use . . .

Bacitracin. In vials containing 2,000, 10,000, and 50,000 units.

Bacitracin-Nasal. In 15 cc. bottles. Provides 250 U. of bacitracin per cc. and 0.25% desoxyephedrine.

Bacitracin Ophthalmic Ointment. Contains 500 units per gram. In ½ oz. and 1 oz. tubes.

A Dosage Form for Virtually Every Topical Need

The topical antibiotic properties of bacitracin can be employed to their fullest therapeutic advantage by the use of the dosage forms shown.

Bacitracin Ointment is widely used in the local management of infected skin lesions. Bacitracin Ophthalmic Ointment is advantageously employed in many infectious lesions of the eyes.

In the topical management of carbuncles, large furuncles and infected wounds, bacitracin in solution, injected directly into the base of the lesion, leads to prompt remission and usually obviates the need for surgery.

Bacitracin Troches are valuable in the management of pharyngeal and oral infections due to bacitracin-sensitive organisms, while Bacitracin-Nasal (with vasoconstrictor) has been found of benefit in acute and chronic sinusitis.

Bacitracin Oral Tablets, the newest dosage form, lead to outstanding results in amebiasis. Each tablet contains 10,000 units of bacitracin. These tablets exert a profound local bacitracin influence within the intestinal tract, and little or no bacitracin is absorbed into the circulation.

Each of these bacitracin preparations is characterized by its low index of allergenicity, an extremely important factor in topical therapy.

Bacitracin Oral Tablets. 10,000 units each, in bottles of 75.

Bacitracin Troches. 1,000 units each, in bottles of 25.

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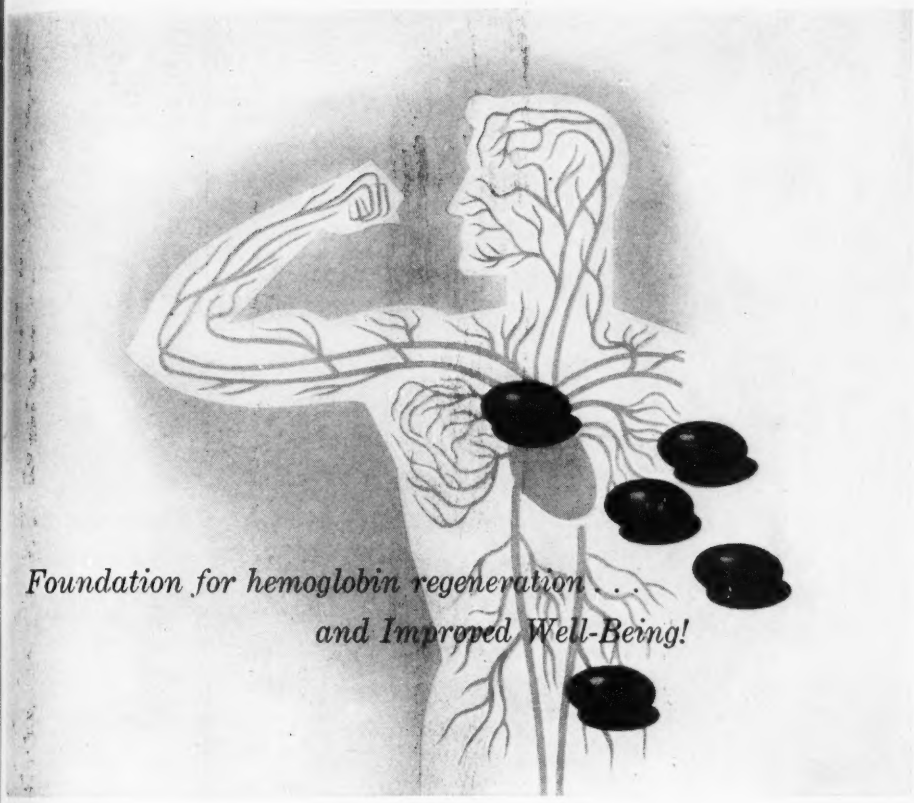

HEMOSULES* 'WARNER'

the preferred hematinic . . .

HEMOSULES* 'Warner' contains the several hematopoietic factors of established importance in blood regeneration for obtaining optimal results in hypochromic anemias.

HEMOSULES* 'Warner' are high-potency, vitamin-rich capsules which also contain liver concentrate and highly absorbable ferrous sulfate.

Each HEMOSULES* capsule provides:	
Ferrous sulphate, Dried U.S.P.	162.0 mg (2.5 grs)
Liver concentrate (1:20)	162.0 mg (2.5 grs)
Folic acid**	0.75 mg
Thiamine hydrochloride (vitamin B_1)	1.0 mg
Riboflavin (vitamin B_2)	1.0 mg
Niacinamide†	4.0 mg
Pyridoxine hydrochloride (vitamin B_6)**	0.5 mg
Calcium pantothenate**	0.5 mg
Ascorbic acid (vitamin C)	15.0 mg

HEMOSULES* are indicated in all secondary anemias due to or accompanying impaired absorption or assimilation, nutritive inadequacy, increased requirements in obstetrical patients, gynecological and gastroenterological disorders, surgical operations, and infectious diseases.

HEMOSULES* 'Warner'—hematinic capsules—are available in bottles of 96, 250 and 1,000 at all leading pharmacists.

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**The need for pyridoxine hydrochloride, calcium pantothenate and folic acid in human nutrition has not been established.
†The minimum daily requirement for niacinamide has not been established.

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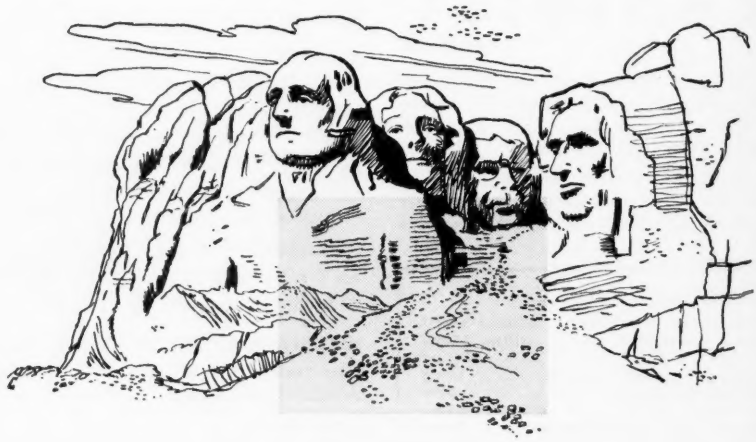
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